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OFFICIAL GAZETTE

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December 3, 1985

U.S. DEPARTMENT OF COMMERCE

Patent and Trademark Office

PUBLISHED WEEKLY BY AUTHORITY OF CONGRESS

OFFICIAL GAZETTE of the UNITED STATES PATENT AND TRADEMARK OFFICE

December 3, 1985 Volume 1061 Number 1

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The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.
THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly.
GENERAL INFORMATION concerning PATENTS.
GENERAL INFORMATION concerning TRADEMARKS.

COPIES OF PATENTS are furnished by the Patent and Trademark Office at $1.50 each; PLANT PATENTS in color, $6.00 each; copies of TRADEMARKS at $1.00 each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. Code P.T.O.

PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1052 O.G. 52 on Mar. 26, 1985.

For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

Certain domestic fees for international applications have been changed effective Oct. 5, 1985 in the rule change notice titled "Revision of Patent Fees" published at 1057 O.G. 24 on Aug. 20, 1985.

The Search fee of the European Patent Office has been changed as of Oct. 12, 1985 and is announced in the *Official Gazette* at 1058 O.G. 26 on Sept. 24, 1985.

International PCT fees have been changed effective Oct. 29, 1985 and were announced in the *PCT Gazette* on Aug. 29, 1985 and in the *Official Gazette* at 1058 O.G. 26 on Sept. 24, 1985.

The current schedule of PCT fees is as follows:

Transmittal fee:	170.00
Search fee	
U.S. Patent and Trademark Office as Searching Authority	
—No corresponding prior U.S. national application filed:	420.00
—Corresponding prior U.S. national application filed	250.00
European Patent Office as Searching Authority, all cases	750.00
International fees	
Basic fee (first 30 pages):	280.00
Basic Supplemental fee (for each page over 30):	6.00
Designation fee for the first 10 national or regional offices:	70.00
Designation fee for 11th and subsequent designations	No charge

DONALD J. QUIGG,
Oct. 21, 1985. *Assistant Secretary and Commissioner of Patents and Trademarks.*

Board of Appeals Decisions Rendered in the month of Oct. 1985

Affirmed	168
Affirmed in Part	22
Reversed	73
Total	263

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), as amended effective Oct. 5, 1985. If the maintenance fee is not paid in a patent requiring such payment, the patent will expire on the 4th, 8th or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on Nov. 30, 1982 for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,360,930 through 4,361,911
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months are set forth in 37 CFR 1.20(e) and (h), as amended effective Oct. 5, 1985, which are reproduced below:

37 CFR §1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant . . . $ 225.00"

"(h) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:
By a small entity (§1.9(f)) . . . . . $ 225.00
By other than a small entity . . . . . $ 450.00"

The amounts of the surcharges, as amended effective Oct. 5, 1985, are set forth in 37 CFR 1.20 (k) and (l), which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982 . . . . . $ 110.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:
By a small entity (§1.9(f)) . . . . . $ 55.00
By other than a small entity . . . . . $ 110.00"

Section 1.20 paragraph (m) as amended as a result of enactment of Public Law 98–622 effective Nov. 8, 1984, is reproduced below:

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay in payment is shown to the satisfaction of the Commissioner to have been unavoidable . . . . . $ 500.00"

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the

indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.19(a)).

4,399,516, Re. S.N. 766,912, Filed Aug. 16, 1985, Cl. 364/716, STORED — PROGRAM CONTROL MACHINE, Donald E. Blahut, et al., Owner of Record: *Bell Telephone Laboratories, Inc., Murray Hill, N.J.*, Attorney or Agent: S. E. Hollander, et al., Ex. Gp.: 232

4,400,897, Re. S.N. 752,314, Filed July 3, 1985, Cl. 37/104, METHOD AND RAILWAY TRAIN FOR DRAINING A RAILWAY TRACK, Fredy Scheuchzer, et al., Owner of Record: *Les Fils D'Auguste, Scheuchzer S. A., Lausanne, Switzerland*, Attorney or Agent: Robert E. Burns, et al., Ex. Gp.: 337

4,423,077, Re. S.N. 785,357, Filed Oct. 7, 1985, Cl. 424/325, PERFLUOROCHEMICAL EMULSION ARTIFICIAL BLOOD, Henry A. Sloviter, Owner of Record: *University of Pennsylvania, Philadelphia, Pa.*, Attorney or Agent: Arthur H. Seidel, et al., Ex. Gp.: 125

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

No Publications This Issue.

Current Membership of Performance Review Board

This notice announces the termination of Richard J. Wieland's appointment. He has retired. He is succeeded by Robert F. Kempf.

The current membership of the Board is as follows:

Donald J. Quigg, Chairman, Deputy Commissioner of Patents and Trademarks, U.S. Patent and Trademark Office, Washington, D.C. 20231. Term—permanent

Rene D. Tegtmeyer, Member, Assistant Commissioner for Patents, U.S. Patent and Trademark Office, Washington, D.C. 20231. Term—permanent

Margaret M. Laurence, Member, Assistant Commissioner for Trademarks, U.S. Patent and Trademark Office, Washington, D.C. 20231. Term—permanent

Bradford R. Huther, Member, Assistant Commissioner for Finance and Planning, U.S. Patent and Trademark Office, Washington, D.C. 20231. Term—permanent

Theresa A. Brelsford, Member, Assistant Commissioner for Administration, U.S. Patent and Trademark Office, Washington, D.C. 20231. Term—permanent

Samuel S. Matthews, Member, Director, Patent Examining Group 250, U.S. Patent and Trademark Office, Washington, D.C. 20231. Term—expires Jan. 31, 1986

Robert F. Kempf, (Outside) Member, Assistant General Counsel for Patent Matters, Office General Counsel, HQ National Aeronautics and Space Administration, Washington, D.C. 20546. Term—expires Oct. 1, 1988

Samih N. Zaharna, Member, Director, Patent Examining Group 320, U.S. Patent and Trademark Office, Washington, D.C. 20231. Term—expires Jan. 31, 1986

Persons desiring any further information about the membership of the PRB may contact Ms. Carolyn P. Acree, Personnel Office, U.S. Patent and Trademark Office, Washington, D.C. 20231. Telephone (703) 557-2662.

DONALD J. QUIGG,
Oct. 18, 1985. *Asst. Secretary and Commissioner of Patent and Trademarks.*

Change to the Processing Period for Trademark Registrations Issued

The processing period between publication for opposition and registration will be changed from 10 weeks to 12 weeks beginning with applications published for opposition on Oct. 15, 1985. Therefore, from Oct. 15, 1985 onward, trademark applicants can expect to receive a registration 12 weeks after the mark is published for opposition so long as an opposition or request for extension of time to oppose is not filed against their application.

As a result of the change from a 10-week to a 12-week processing period, few if any registrations will issue in the Dec. 24, 1985 and Dec. 31, 1985 Trademark Official Gazettes.

MARGARET M. LAURENCE,
Oct. 29, 1985. *Assistant Commissioner for Trademarks.*

Errata

The following registration numbers were inadvertently listed as vacated in an Errata notice in the Trademark Official Gazette of July 2, 1985 at page TMOG 3:

1,335,033	TM 156	May 14, 1985
1,335,085	TM 157	May 14, 1985

Consequently, the above-identified registrations are still active.

PATRICIA M. DAVIS,
Oct. 30, 1985. *Administrator for Trademark Operations.*

Extension of Time for Filing Notice of Opposition to Marks Published in the Official Gazette Dated October 15, 1985

Copies of the Official Gazette dated Oct. 15, 1985 were not mailed until Oct. 21, 1985. Therefore, for marks published in the Official Gazette dated Oct. 15, 1985, Notices of Opposition filed by Nov. 19, 1985 will be considered timely.

MARGARET M. LAURENCE,
Oct. 30, 1985. *Assistant Commissioner, for Trademarks.*

PATENT NOTICES

Certificates of Correction for the Week of Dec. 3, 1985

Re. 31,744	4,505,615	4,526,940	4,536,452
Re. 31,823	4,506,755	4,526,954	4,536,560
4,189,171	4,506,772	4,527,181	4,536,640
4,210,442	4,508,773	4,527,902	4,536,321
4,243,250	4,509,685	4,528,138	4,537,122
4,290,174	4,509,883	4,528,254	4,537,339
4,404,017	4,510,283	4,529,303	4,537,576
4,408,514	4,511,301	4,529,698	4,537,802
4,416,397	4,511,693	4,529,849	4,538,361
4,416,833	4,512,615	4,529,855	4,538,472
4,419,591	4,514,396	4,530,035	4,538,560
4,423,976	4,514,518	4,530,229	4,538,919
4,435,445	4,514,648	4,530,550	4,539,010
4,438,096	4,515,073	4,530,702	4,539,032
4,439,996	4,515,687	4,530,939	4,540,211
4,440,831	4,516,184	4,531,526	4,540,228
4,442,591	4,516,539	4,531,605	4,540,792
4,444,284	4,518,173	4,532,019	4,540,930
4,453,067	4,518,217	4,532,519	4,541,087
4,455,867	4,518,267	4,532,547	4,541,551
4,466,388	4,518,413	4,532,618	4,541,738
4,468,586	4,520,445	4,532,661	4,541,794
4,470,121	4,520,661	4,532,747	4,541,997
4,476,123	4,521,482	4,532,763	4,542,047
4,478,600	4,521,516	4,532,792	4,542,065
4,481,170	4,521,607	4,533,406	4,542,516
4,485,414	4,521,666	4,533,482	4,543,113
4,488,115	4,521,716	4,534,291	4,543,724
4,488,582	4,522,035	4,534,782	4,543,894
4,490,548	4,522,082	4,534,985	4,544,023
4,492,968	4,522,323	4,535,083	4,544,035
4,493,550	4,522,562	4,535,163	4,544,040
4,495,255	4,522,745	4,535,172	4,544,170
4,497,820	4,525,238	4,535,408	4,544,275
4,499,076	4,525,472	4,535,855	4,544,637
4,501,765	4,526,279	4,535,865	4,545,181
4,503,131	4,526,857	4,535,938	4,545,341
4,504,148	4,526,879	4,536,104	4,545,820

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The following libraries, designated as Patent Depository Libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent years to all or most of the patents issued since 1790.

These patent collections are open to public use and each of the Patent Depository Libraries, in addition, offers the publications of the U.S. Patent Classification System (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the Patent Depository Libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Auburn University Libraries	(205) 826-4500 Ext.21
	Birmingham Public Library	(205) 226-3680
Alaska	Anchorage Municipal Libraries	(907) 264-4481
Arizona	Tempe: Science Library, Arizona State University	(602) 965-7607
Arkansas	Little Rock: Arkansas State Library	(501) 371-2090
California	Los Angeles Public Library	(213) 612-3273
	Sacramento: California State Library	(916) 322-4572
	San Diego Public Library	(619) 236-5813
	Sunnyvale: Patent Information Clearinghouse*	(408) 730-7290
Colorado	Denver Public Library	(303) 571-2122
Delaware	Newark: University of Delaware Library	(302) 451-2238
Florida	Fort Lauderdale: Broward County Main Library	(305) 357-7444
	Miami–Dade Public Library	(305) 375-2665
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
Idaho	Moscow: University of Idaho Library	(208) 885-6235
Illinois	Chicago Public Library	(312) 269-2865
	Springfield: Illinois State Library	(217) 782-5430
Indiana	Indianapolis–Marion County Public Library	(317) 269-1706
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Maryland	College Park: Engineering and Physical Sciences Library, University of Maryland	(301) 454-3037
Massachusetts	Amherst: Physical Sciences Library, University of Massachusetts	(413) 545-1370
	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Ann Arbor: Engineering Transportation Library, University of Michigan	(313) 764-7494
	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library & Information Center	(612) 372-6570
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 390
Montana	Butte: Montana College of Mineral Science and Technology Library	(406) 496-4283
Nebraska	Lincoln: University of Nebraska-Lincoln, Engineering Library	(402) 472-3411
Nevada	Reno: University of Nevada Library	(702) 784-6579
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7815
New Mexico	Albuquerque: University of New Mexico Library	(505) 277-5441
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 714-8529
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Oregon	Salem: Oregon State Library	(503) 378-4239
Pennsylvania	Cambridge Springs: Alliance College Library	(814) 398-2098
	Philadelphia: Franklin Institute Library	(215) 448-1227
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-8726
South Carolina	Charleston: Medical University of South Carolina Library	(803) 792-2372
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 725-8876
	Nashville: Vanderbilt University Library	(615) 322-2775
Texas	Austin: McKinney Engineering Library, University of Texas	(512) 471-1610
	College Station: Sterling C. Evans Library, Texas A & M University	(409) 845-2551
	Dallas Public Library	(214) 749-4176
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Utah	Salt Lake City: Marriott Library, University of Utah	(801) 581-8394
Virginia	Richmond: Virginia Commonwealth University Library	(804) 257-1104
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3247

All of the above-listed libraries offer CASSIS (Classification And Search Support Information System), which provides direct, on-line access to Patent and Trademark Office data.

*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

JAMES E. DENNY, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF October 26, 1985

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	3-14-84
ORGANIC CHEMISTRY AND BIOTECHNOLOGY, GROUP 120—C. E. VAN HORN, Director	6-01-83
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. F. WHITE, Director	4-12-84
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	8-06-84
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—G. GOLDBERG, Director	9-30-83
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	3-21-83
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—E. LEVY, Director	11-21-83
PACKAGES, CLEANING, TEXTILES, AND GEOMETRICAL INSTRUMENTS, GROUP 240—E. E. KUBASIEWICZ, Director	6-15-84
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director	3-28-83
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260—S. G. KUNIN, Director	8-30-83
DESIGN, GROUP 290—K. L. CAGE, Director	3-07-83
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director	7-12-83
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—S. N. ZAHARNA, Director	8-29-83
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—R. E. AEGERTER, Director	3-14-83
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—D. J. STOCKING, Director	10-19-83
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	10-02-84

Expiration of patents: The patents within the range of numbers indicated below expire during October 1985, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,403,406 to 3,408,656, inclusive

Plant Patents ..... Numbers 2,835 to 2,843 inclusive

STATUTORY INVENTION REGISTRATIONS

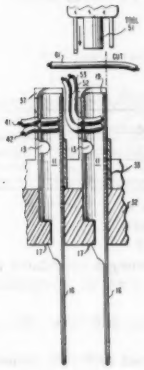
PUBLISHED DECEMBER 3, 1985

A statutory invention registration is not a patent. It has the defensive attributes of a patent but does not have the enforceable attributes of a patent. No article or advertisement or the like may use the term patent, or any term suggestive of a patent, when referring to a statutory invention registration. For more specific information on the rights associated with a statutory invention registration see 35 U.S.C. 157.

H1
SPLIT BARREL INSULATION DISPLACING CONNECTOR

Montri Wattana-Chayakul, Lake Hiawatha, N.J., assignor to Bell Telephone Laboratories, Inc., Murray Hill, N.J.

Filed Mar. 5, 1984, Ser. No. 585,951
Int. Cl.[4] H01R *4/24*
U.S. Cl. 339—97 P **10 Claims**



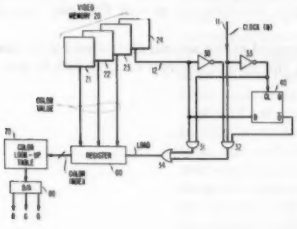
1. An electrical contact having a cylindrical configuration, having first and second ends and having an open longitudinal wire receiving seam for receipt of two or more wires therein, the improvement comprising;

an aperture located in the receiving seam a predetermined distance from said first end of said contact and adapted to release at least one of said wires in the receiving seam as an additional wire is placed in the wire receiving seam.

H2
VIDEO DISPLAY SYSTEM WITH INCREASED HORIZONTAL RESOLUTION

Gerald S. Soloway, Holmdel, N.J., assignor to AT&T Technologies Incorporated, Berkeley Heights, N.J.

Filed Dec. 9, 1983, Ser. No. 559,630
Int. Cl.[4] G09G *1/28, 1/14*
U.S. Cl. 340—701 **11 Claims**



1. A video display system for assembling data received from a data source and for displaying this data in the form of color images on a video display, the system comprising:

means for receiving the data from the source;

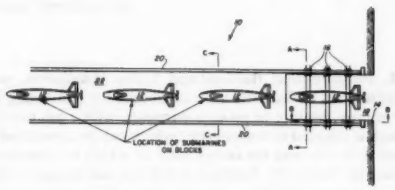
means for producing color image data having both horizontal and vertical coordinates and horizontal positional offset data representative of the data received; and

means for assembling the color image data and the positional offset data such that the positional offset data in a first state provides an offset value for changing the value of the horizontal coordinate of the color image data, and in a second state does not provide an offset value for changing the value of the horizontal coordinate of the color image data, the assembling means providing the offset value to the value of the horizontal coordinate of the color image data by delaying in time the displaying of the color image data in the horizontal direction on the video display.

H3
ORIGINAL METHOD OF DRYDOCKING SHIPS

Michael Yachnis, Washington, D.C., assignor to The United States of America, Washington, D.C.

Filed May 8, 1985, Ser. No. 731,700
Int. Cl.[4] B63C *3/06*
U.S. Cl. 405—3 **8 Claims**



1. An apparatus for moving a large ship from water to a predetermined area for repair thereof comprising:

at least one gantry crane;

at least one holding means for holding the ship on as it is lifted by the gantry crane out of the water, said holding means being attached to said gantry crane;

guidance means to guide the ship while it is on the gantry crane to the predetermined repair area; and

means for enabling the holding means to be emplaced on the ship, said enabling means having an entrance.

H4
PROCESSS FOR THE PREPARATION OF IMINODIACETONITRILE

Barry A. Cullen, Amherst, N.H., assignor to W. R. Grace & Co., New York, N.Y.

Continuation of Ser. No. 668,118, Nov. 5, 1984, which is a continuation-in-part of Ser. No. 423,510, Sep. 27, 1982, abandoned. This application May 10, 1985, Ser. No. 732,791
Int. Cl.[3] C07C *121/43, 121/44*
U.S. Cl. 260—465.5 A **8 Claims**

1. A batch process for the producton of iminodiacetonitrile which comprises:

(a) pre-neutralizing a first aqueous solution of hexamethylenetetramine to a pH between about 5.5 and about 6.5 with an acid and adjusting the temperature to between about 0° C. to about 60° C.;

(b) forming a second aqueous solution by adding HCN to the first aqueous solution while maintaining the temperature between about 20° C. and about 90° C. with cooling and

the pH between about 5.5 and 6.5 by the addition of formaldehyde; and

(c) cooling the second aqueous solution and then recovering the iminodiacetonitrile product.

H5
PRESSURE-FIRED FLUIDIZED-BED BOILER INSTALLATION

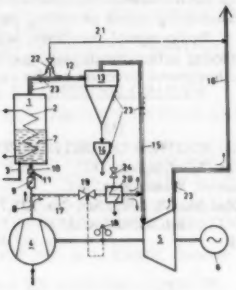
Dilip Mukherjee, Fislisbach, Switzerland, assignor BBC Brown, Boveri & Company Ltd., Baden, Switzerland

Filed Jun. 26, 1985, Ser. No. 748,949

Claims priority, application Switzerland, Jun. 29, 1984, 3147/84

Int. Cl.⁴ F02G *1/00*

U.S. Cl. 60—39.182 **2 Claims**



1. Pressure-fired fluidised-bed boiler installation, with a fluidised-bed boiler fired with small coal for generating steam for energy, heating or process purposes, with a gas turbine set which is coupled to a generator, which can be connected as an electric motor, and the compressor of which is connected via a main air duct to the fluidised-bed boiler and the gas turbine of which is connected via a flue gas duct with an interposed dust precipitation device to the fluidised-bed boiler, the dust precipitation device having a dust filter and a dust discharge lock, and also with an off-gas duct for discharging the flue gases, expanded in the gas turbine, into the open, characterised by a preheating device which is intended to preheat to a temperature above the dew point of water those parts of the installation which are at risk, when the boiler installation is started up after an interruption in operation, due to mixing of the water vapour condensing out of the flue gases with deposits of fine dust, and which essentially comprises the following components:

a preheating burner (**10**) located in the main air duct (**8**) upstream of the fluidised-bed boiler (**1**),

a control valve (**9**) in the main air duct (**8**) immediately upstream of the preheating burner (**10**),

a heating air duct (**17**) which branches off the main air duct (**8**) and leads into the flue gas duct (**15**) located between the dust precipitation device (**13+14**) and the gas turbine (**5**),

a control valve (**19**) in the heating air duct (**17**),

a heat exchanger (**20**), provided between the control valve (**19**) and the flue gas duct (**15**), for heating the air flowing through the heating air duct (**17**), and

a heating air discharge line (**21**) which connects the flue gas duct (**12**) immediately adjoining the fluidised-bed boiler (**1**) to the off-gas duct (**16**).

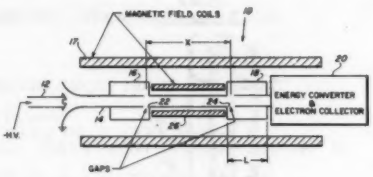
H6
GENERATION OF A MODULATED IREB WITH A FREQUENCY TUNABLE BY A MAGNETIC FIELD

Moshe Friedman, Washington, D.C., and Victor Serlin, Springfield, Va., assignors to The United States of America, Washington, D.C.

Filed Jul. 8, 1985, Ser. No. 752,867

Int. Cl.⁴ H01J *25/00*

U.S. Cl. 315—4.0 **12 Claims**



1. A device for generating a modulated intense relativistic electron beam (IREB) with an electronically tunable frequency, comprising:

a longitudinally running drift tube with a first and second ends;

a plurality of gaps in said drift tube including a first gap in said drift tube, and a second gap in said drift tube disposed a predetermined distance x from said first gap;

a plurality of cavities, with a cavity disposed around said drift tube at the location of each of said plurality of gaps, said plurality of cavities including a first cavity disposed around said drift tube at the location of said first gap, and a second cavity disposed around said drift tube at the location of said second gap, said first and second cavities having volumes and geometry such as to excite a predetermined frequency band below a plasma frequency;

means for generating an intense relativistic electron beam (IREB) and injecting said IREB to propagate within said drift tube from said first end, and having said predetermined plasma frequency;

main magnetic field generating means for generating a magnetic field running parallel to and within said drift tube for confining said IREB to a desired beam diameter;

auxiliary magnetic field generating means for generating an auxiliary magnetic field running parallel to and within said drift tube and located only along a predetermined length between said first and second gaps, said auxiliary magnetic field generating means being tunable to thereby tune the frequency of excitation in said first and second cavities; and

means disposed at the second end of said drift tube for converting the kinetic energy of said IREB into electrical energy.

DEFENSIVE PUBLICATIONS

PUBLISHED DECEMBER 3, 1985

Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O.G. 687. The abstracts of Defensive Publication applications are identified by distinctly numbered series and are arranged chronologically. The heading of each abstract indicates the number of pages of specification, including claims and sheets of drawings contained in the application as originally filed. The files of these applications are available to the public for inspection and reproduction may be purchased for 30 cents a sheet.

Defensive Publication applications have not been examined as to the merits of alleged invention. The Patent and Trademark Office makes no assertion as to the novelty of the disclosed subject matter.

T106,101

STRUCTURE OF AN IMPROVED BIPOLAR TRANSISTOR

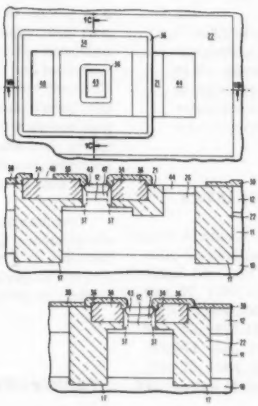
Joseph R. Cavaliere, Bykenhulle Rd., Hopewell Junction, N.Y. 12533; Cheng T. Horng, 6396 Gondola Way, San Jose, Calif. 95120; Richard R. Konian, 49 Brookland Farms Rd., Poughkeepsie, N.Y. 12601; Hans S. Rupprecht, 3505 Kamhi Dr., Yorktown Heights, N.Y. 10598, and Robert O. Schwenker, 6359 Gondola Way, San Jose, Calif. 95120

Continuation of Ser. No. 310,671, Oct. 13, 1981, abandoned, which is a division of Ser. No. 126,611, Mar. 3, 1980, Pat. No. 4,338,138. This application Jan. 28, 1985, Ser. No. 695,657

Int. Cl.[4] H01L *29/70*

U.S. Cl. 357—34

8 Sheets Drawing. 38 Pages Specification



An improved bipolar transistor structure formed in a very small area of a thin epitaxial layer on a planar surface of a silicon substrate of first conductivity type, said very small area of the thin epitaxial layer having vertical sidewalls extending to the planar surface of said substrate, said area of thin epitaxial layer containing in the order recited a shallow depth emitter region of a second conductivity type having an exposed planar surface, a shallow depth base region of said first conductivity type, and a shallow depth active collector region of said second conductivity type, an elongated region of said first conductivity type surrounding said emitter, base and active collector regions, said elongated region being contained within and coextensive with said vertical sidewalls of said small area of said thin epitaxial layer, whereby the base collector capacitance is materially reduced due to the very small area of the base-collector junction.

REISSUES

DECEMBER 3, 1985

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 32,042

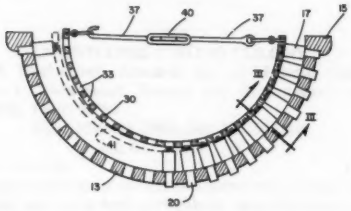
STATOR BLADE ASSEMBLY FOR TURBO MACHINES

J. Rodger Sheilds, Pittsburgh, and Alexander A. Carroll, Greensburg, both of Pa., assignors to Elliott Turbomachinery Company, Inc., Jeannette, Pa.

Original No. 3,887,976, dated Jun. 10, 1975, Ser. No. 335,973, Feb. 26, 1973. Division of Ser. No. 112,163, Feb. 3, 1971, abandoned. Application for reissue Aug. 31, 1979, Ser. No. 71,621

Int. Cl.[4] B21K *3/00*

U.S. Cl. 29—156.8 R **5 Claims**



1. The method of assembling an arcuate shroud ring to the inner ends of an arcuate series of stator blades extending in a radial direction inwardly from a machine casing, the ring having apertures spaced apart circumferentially for receiving in registration therewith said blade ends, the method including

contracting the shroud ring by [applying a force thereto] *connecting an extensible rod to opposed ends thereof and retracting the rod* to reduce the diameter of the shroud ring to a diameter less than that described by the ends of the blades in the series whereby at least one blade receiving aperture in the ring is insertable into one of said blade ends,

inserting said one aperture into said one blade end, and

[relieving said contracting force to permit] *extending the rod to expand* the shroud ring [to expand] *to a normal contour and* whereby the remaining apertures move into receiving registration with the remaining blade ends in said series.

Re. 32,043

PORTABLE CONCRETE MIXING AND TRANSPORT APPARATUS

Edwin J. Routson, 135 N. Oakwood, West Chicago, Ill. 60185

Original No. 4,387,995, dated Jun. 14, 1983, Ser. No. 261,579, May 7, 1981. Application for reissue Aug. 15, 1984, Ser. No. 641,188

Int. Cl.[4] B28C *5/22, 5/42, 7/16*

U.S. Cl. 366—2 **6 Claims**

14. Apparatus for mixing and transporting concrete comprising:

a trailer with a longitudinal axis;

a pair of wheels rotatably mounted on said trailer and supporting said trailer for transport, said pair of wheels having a coincident axis of rotation perpendicular to the longitudinal axis of said trailer;

a rotatable drum for holding concrete and having an axis of rotation parallel to the axis of rotation of said pair of wheels;

support means mounted on said trailer for receiving and rotatably supporting said drum and for holding said drum in contact with said pair of wheels for rotation by said wheels;

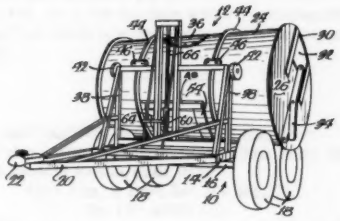
means between said trailer and said drum for raising and lowering said drum out of and into driving engagement with said wheels, said drum comprising:

a cylinder having closed end walls;

an inlet door in said cylinder for facilitating loading the concrete into said cylinder;

an access door in one end wall for access to facilitate maintenance or to facilitate loading the concrete into said cylinder;

a sliding door in the other end wall;



a discharge chute mounted on the other end wall below said sliding door and cooperating with said sliding door in order to facilitate discharge of the concrete from said cylinder; and

a plurality of agitating bars mounted on one end to the interior surface of one end wall and on the other end, mounted to the interior surface of the other end wall, said plurality of agitating bars parallel to each other and parallel to rotational axis of said cylinder, for agitating the concrete when the cylinder is rotated.

Re. 32,044

CATALYST FOR STEAM REFORMING OF HYDROCARBONS

Kenton Atwood, New Albany, Ind., and James H. Wright, Louisville, Ky., assignors to United Catalysts, Inc., Louisville, Ky.

Original No. 4,337,178, dated Jun. 29, 1982, Ser. No. 201,992, Oct. 29, 1980. Continuation-in-part of Ser. No. 024,005, Mar. 26, 1979, Pat. No. 4,233,187, which is a continuation-in-part of Ser. No. 817,160, Jul. 20, 1977, abandoned, and Ser. No. 708,941, Jul. 27, 1976, abandoned. Application for reissue Jun. 27, 1984, Ser. No. 624,923

The portion of the term of this patent subsequent to Nov. 11, 1997, has been disclaimed.

Int. Cl.[4] B01J *21/04, 23/74*

U.S. Cl. 502—335 **7 Claims**

1. A [hydrocarbon reforming] catalyst, comprising a [cylindrical] *cylindrical* refractory support [selected from the group consisting of aluminum oxide, magnesium oxide, calcium oxide and metal aluminate spinels, and] having two or more gas passages extending axially therethrough from one end to the other and a catalytically-active metal comprising nickel or cobalt oxide deposited thereon [in a concentration of 6% to 30% by weight, expressed as the metal oxide], said catalyst having a Relative Activity Coefficient Factor (ACF[®]^R) and a Relative Pressure Factor (PF[®]^R) being in excess of that when compared to a standard ring, said ACF[®]^R being in excess of [1] *1.15* and the ratio of ACF[®]^R to said PF[®]^R being in excess of [1:1] *1.25:1*, the Height (H) of said support bearing a relationship to the effective internal diameter of each of said gas passages (ID), the ratio of H:ID being less than 4:1.

PLANT PATENTS

GRANTED DECEMBER 3, 1985

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

5,582
NEW ROSE PLANT

John L. Harkness, 1 Bank Alley, Southwold, Suffolk IP18 6JD, England

Filed Mar. 22, 1984, Ser. No. 592,406
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—22 **1 Claim**

1. A new and distinct variety of rose plant of the floribunda class, substantially as shown and described, characterized particularly by flowers of unique apricot coloring having unusually good disease resistance for plants with flowers of this color range and attractive dark green, holly-like foliage.

5,583
ALMOND TREE ("WOOD COLONY")

David E. Blickenstaff, deceased, late of Modesto, Calif., by Esther L. Blickenstaff, Trustee, 617 W. Granger - No. 33, Modesto, Calif. 95350

Filed Mar. 26, 1984, Ser. No. 593,496
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—30 **1 Claim**

1. A new and distinct variety of almond tree, substantially as illustrated and described, particularly characterized by relatively small size and slow growth, by a sturdy scaffold structure with many nut-bearing limbs and spur growth about the scaffold limbs, by minimal sucker growth interior of the tree, by blooming and harvesting after the Nonpareil, by excellent pollinization of other varieties such as the Nonpareil and Carmel, by bearing nuts which have minimal pre-drop at dehiscence but easily harvest and hull, most nuts breaking from the hull at harvest, and the nuts both as to the shell and kernel size being similar to the Ne Plus, and the shell being relatively soft and similar to the Carmel.

5,584
APPLE TREE

Daniel F. Dayton; Safi Korban, both of Urbana, Ill.; Edwin B. Williams, Lafayette, Ind.; Jules Janick; Frank H. Emerson, both of W. Lafayette, Ind., and L. Fredric Hough, Blairstown, N.J., assignors to Purdue Research Foundation, West Lafayette, Ind.

Filed Jan. 23, 1984, Ser. No. 572,809
Int. Cl.[4] A01H *5/03*
U.S. Cl. Plt.—34 **1 Claim**

1. A new and distinct apple tree substantially as shown and described, particularly characterized by resistance to apple scab, attractive red color, good flavor, and maturing approximately with 'Prima', and four weeks before 'Jonathan'.

5,585
PLUM TREE, "WUHL"

Richard Peters, 4854 E. Butler Ave., and Eric Wuhl, 5480 E. Lane St., both of Fresno, Calif. 93727

Filed Mar. 1, 1984, Ser. No. 585,267
Int. Cl.[4] A01H *5/03*
U.S. Cl. Plt.—38 **1 Claim**

1. A new and distinct variety of plum tree substantially as shown and described, characterized by its general similarity to the Black Beaut Plum Tree (U.S. Plant Pat. No. 3,617), but differing therefrom in its bearing of uniformly large fruit having redder flesh than that of the Black Beaut which clings over the entire surface of its stone, which is thicker and has less of a tendency to crack than that of the Black Beaut.

5,586
NECTARINE TREE, "STAR BRITE"

Richard Peters, 4854 E. Butler Ave., and Eric Wuhl, 5480 E. Lane St., both of Fresno, Calif. 93727

Filed Mar. 1, 1984, Ser. No. 585,266
Int. Cl.[4] A01H *5/03*
U.S. Cl. Plt.—41 **1 Claim**

1. A new and distinct variety of nectarine tree, substantially as illustrated and described, particularly characterized by its being most nearly similar to the May Grand Nectarine Tree of U.S. Plant Pat. No. 2,794, but from which it is distinguished by producing fruit which is larger, redder and which ripens five days earlier.

5,587
NECTARINE TREE, "MIKE'S GRAND"

Richard Peters, 4854 E. Butler Ave., and Eric Wuhl, 5480 E. Lane St., both of Fresno, Calif. 93727

Filed Mar. 1, 1984, Ser. No. 585,272
Int. Cl.[4] A01H *5/03*
U.S. Cl. Plt.—41 **1 Claim**

1. A new and distinct variety of nectarine tree substantially as illustrated and described broadly characterized by its general similarity to the May Grand Nectarine Tree (U.S. Plant Pat. No. 2,794) in its early bearing of fruit having yellow flesh but from which it is distinguished as to novelty by its regular and very productive bearing of fruit having a more completely yellow flesh and a somewhat flatter appearance, ripening two or three days earlier than that of the May Grand variety.

5,588
GRAPEVINE

Elmer Swenson, Osceola, Wis., assignor to Swenson-Smith Vines, Inc., Excelsior, Minn.

Filed Jan. 30, 1984, Ser. No. 574,874
Int. Cl.[4] A01H *5/03*
U.S. Cl. Plt.—47 **1 Claim**

1. A new and distinct variety of grapevine, substantially as shown and described herein, characterized particularly as to novelty by the unique combination of winter hardiness down to −35° Fahrenheit in central or southern Wisconsin and Minnesota, producing white grapes which made a good quality of wine comparable to a German style white wine, and grapes with relatively low acidity, average sugar content and a flavor or aroma absent the typical foxiness or labrusca of earlier varieties.

5,589
CARNATION NAMED MUFUGO

Jacob van Andel, Aalsmeer, Netherlands, assignor to B. V. Handelskwekerij/M. C. van Staaveren, Aalsmeer, Netherlands

Filed Nov. 30, 1983, Ser. No. 556,458
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—70 **1 Claim**

1. The new and distinct variety of miniature carnation plant, substantially as herein shown and described, characterized in particular by its rapid and profuse production of small red-purple flowers and the large number of flowers appearing on each flowering stem.

PATENTS

GRANTED DEC. 3, 1985

ERRATA

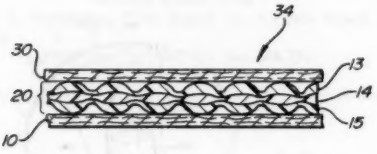
For CLASS	See PATENT NO.
623–040	4,555,817
187–038	4,556,155
384–130	4,556,239
514–258	4,556,563
361–321	4,556,929

PATENTS

GRANTED DECEMBER 3, 1985

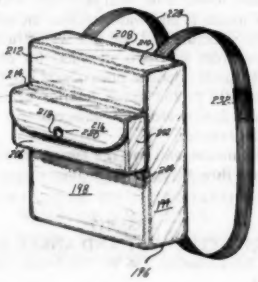
GENERAL AND MECHANICAL

4,555,811
EXTENSIBLE MICROFINE FIBER LAMINATE
Charles J. Shimalla, Kendall Park, N.J., assignor to Chicopee, New Brunswick, N.J.
Filed Jun. 13, 1984, Ser. No. 620,194
Int. Cl.[4] A41B *13/10*
U.S. Cl. 2—51 **31 Claims**



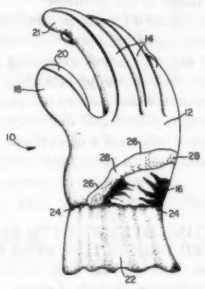
1. An extensible water impervious laminated material having an improved hydrostatic head at higher extension comprising at least one reinforcing layer of nonwoven fibers bonded to at least one hydrophobic creped ply of microfine fibers having a fiber diameter of up to 10 microns.

4,555,812
LIGHT WEIGHT PACK FOR ATTACHING TO THE CLOTHES OF A HIKER
James L. Akers, 18624 140th SE., Renton, Wash. 98055
Filed Sep. 15, 1980, Ser. No. 187,491
Int. Cl.[4] A41D *1/00*
U.S. Cl. 2—94 **20 Claims**



1. A combination of a pouch and a support, said combination comprising:
- a. said pouch having a cavity for receiving an item and an opening to said cavity;
- b. said support being an article of clothing; and,
- c. a first means for attaching said pouch to said support;
- d. said first means for attaching said pouch to said support comprising a base member, a first arm and a second arm;
- e. said first arm and said second arm being capable of projecting through the fabric of said article of clothing to attach said base to said article of clothing;
- f. a first reinforcing plate for positioning on the outside of said support;
- g. a second reinforcing plate for positioning on the inside of said support;
- h. said first arm and said second arm passing through said reinforcing plate and through said reinforcing plate and bending to attach said base to said support;
- i. said first arm and said second arm being capable of being removed from said first reinforcing plate and from said second reinforcing plate and from said support to allow said support and said first means to be separated;
- j. said first arm and said second arm being flexible and being capable of being bent; and,
- k. a first attaching means on said base member and a second attaching means on said pouch for allowing said pouch to be releasably attached to said first attaching means on said base member.

4,555,813
SLIP RESISTANT GLOVES
Michael D. Johnson, Coshocton, Ohio, assignor to Becton, Dickinson and Company, Paramus, N.J.
Division of Ser. No. 512,266, Jul. 11, 1983, Pat. No. 4,514,460, which is a continuation-in-part of Ser. No. 436,253, Oct. 25, 1982, Pat. No. 4,515,851. This application Dec. 10, 1984, Ser. No. 679,786
Int. Cl.[4] B32B *7/00*; A41D *19/00*
U.S. Cl. 2—161 R **5 Claims**



1. A work glove comprised of a pliable laminate having a breathable textured gripping surface for use in a work environment, said work glove characterized by
- (a) a substrate in the form of a glove liner, said substrate being a member selected from the group consisting of a non-woven fibrous web, a woven web, and a knitted web;
- (b) a foamed layer foamed in place onto the outer exposed surface of said glove liner;
- (c) said foamed layer, prior to foaming, having a solids content within the range of between about 5 and 75 percent;
- (d) said foamed layer, after foaming, forming the outer gripping surface of said glove; and
- (e) said foamed layer having an air content within the range of between about 40 and 95 percent.

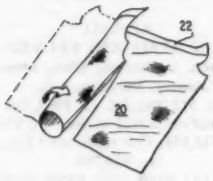
4,555,814
METHOD OF FORMING CLOTH INTO THREE-DIMENSIONAL SHAPES AND THE ARTICLES PRODUCED BY THAT METHOD
I. Weir Sears, Davenport; John E. Hostetler, Bettendorf, and William H. Hulsebusch, Dewitt, all of Iowa, assignors to Apparel Form Company, Davenport, Iowa
Division of Ser. No. 393,824, Jul. 6, 1982, Pat. No. 4,459,704, which is a continuation-in-part of Ser. No. 289,254, Aug. 3, 1981, abandoned. This application Apr. 2, 1984, Ser. No. 596,025
Int. Cl.[4] A41B *1/00*; A41D *1/06*
U.S. Cl. 2—227 **6 Claims**

1. A molded pant constructed from a performed shell of unfinished woven cloth, which has been finished by tentering

on a mold to maintain a predetermined three-dimensional shape conforming to the shape of the mold and wherein said pant has a single seam on its outer periphery and a seam along the inside of each leg thereof.

2. A method for fabricating a garment from cloth comprising:

(a) subjecting a performed cloth shell generally in the size and shape of the garment to one or more treatments to completely finish the cloth, said one or more treatments being carried out while maintaining the cloth shell in



generally uniform tension on a mold in the final three-dimensional shape of the garment.

4. A one-piece pattern for use in fabricating a pant garment from cloth, comprising an upper transverse edge, a lower transverse edge and side edges extending between the upper and lower edges, each side edge including a crotch point; the transverse dimension of said pattern increasing from said lower edge to said crotch points and decreasing from said crotch points to said upper edge;and a central cut extending from the lower edge of said pattern to an inner crotch point.

4,555,815

PROTECTIVE HELMET WITH RELEASABLY CONNECTED PROTECTIVE BREATHING MASK

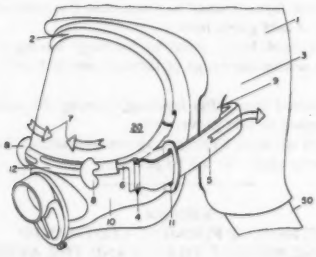
Hans J. Walther, Lubeck, Fed. Rep. of Germany, assignor to Drägerwerk Aktiengesellschaft, Lubeck, Fed. Rep. of Germany

Filed Jan. 10, 1984, Ser. No. 569,599

Claims priority, application Fed. Rep. of Germany, Jan. 11, 1984, 3300646

Int. Cl.⁴ A42B *3/00*

U.S. Cl. 2—424 **7 Claims**



1. A protective helmet combined with a strapless protective breathing mask, comprising locking means associated with said helmet and mask including a mounting saddle having a tubular guide on said mask, a push rod slidable in said tubular guide, a coupling hook engageable with said push rod and with said helmet, biasing means biasing said push rod with said coupling hook in a direction to hold said coupling hook in a biased locking position to hold said mask and said helmet together, and a hand engageable dog connected to said push rod to move said push rod against said biasing means to permit disengagement of said coupling hook and also to permit engagement of said coupling hook with said helmet.

4,555,816

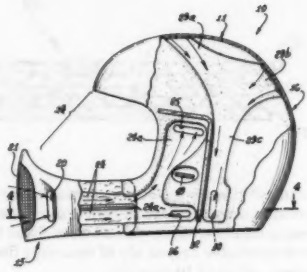
VENTILATED HELMET

Lester V. Broersma, Bellflower, Calif., assignor to Bell Helmets Inc., Norwalk, Calif.

Filed Jan. 23, 1984, Ser. No. 572,893

Int. Cl.⁴ A42B *3/02*

U.S. Cl. 2—425 **21 Claims**



1. In a motorcyclist or bicyclist helmet having dome shaped top wall structure, side wall structures, a front opening for forward viewing, a lower front wall structure which juts forwardly, and rear wall structure, the combination comprising:

(a) a frontward facing air inlet means defined by said wall structure, and including two laterally spaced apart air inlets spaced rearwardly of the forwardmost center portion of said lower front wall structure, and

(b) passage means in said wall structure including said lower front wall structure and said side wall structure to receive air inflow from said two air inlets for circulation rearwardly adjacent opposite sides of said front wall structure and upwardly to the upper interior of the helmet and subsequent downward flow adjacent said wall structure and to the exterior,

(c) said inlet means, and passage means, located to enhance cooling air flow through the helmet.

4,555,817

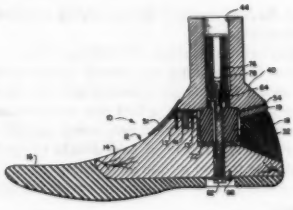
PROSTHETIC FOOT AND ANKLE JOINT

Roderick W. McKendrick, 336 W. 700 North, Salt Lake City, Utah 84103

Filed Jul. 18, 1983, Ser. No. 514,974

Int. Cl.⁴ A61F *1/04*

U.S. Cl. 623—40 **20 Claims**



1. A foot and ankle joint for a prosthetic appliance comprising:

a foot block which provides support for the prosthetic appliance;

a flexible ankle means adjacent the foot block;

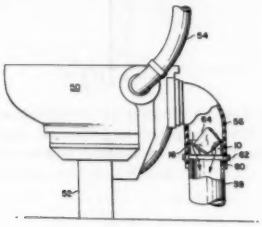
an ankle base adjacent the ankle means, said ankle base having a bore extending therein;
an insert disposed within said bore; and
a cable having a head on one end wherein the cable passes through the insert and the bore, the head of the cable movably resting on the insert and the end of the cable remote from the head, being secured within said foot block so that the foot block, the ankle means, and the ankle base are secured in proper position.

4,555,818

WASTE LINE TRAP

Robert E. Harrington, 5708 Ranger St., Virginia Beach, Va. 23464

Filed Oct. 30, 1984, Ser. No. 666,392
Int. Cl.⁴ E03C *1/26*
U.S. Cl. 4—191 **9 Claims**



1. A waste trap for a conduit comprising:
a solid cylinder having a continuous outer wall and a continuous inner wall, said cylinder being smaller in diameter than said conduit;
a plurality of equidistantly spaced inwardly extending fins on the inner wall, said fins having walls adjacent to the inner wall of the cylinder and equal in height thereto; and
said fins having downwardly extending smooth edges terminating in vertical edges, said vertical edges being smooth and being substantially less in height than the height of the cylinder.

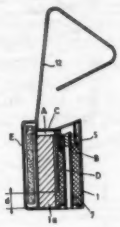
4,555,819

HOLDER FOR CLEANING AND/OR COLORANT PRODUCTS INTENDED TO BE HOOKED FROM THE EDGE OF A WC BOWL

Richard Weiss, Chartres, and Hubert Delagneau, Mainvilliers, both of France, assignors to Reckitt & Colman S.A., Massy, France

PCT No. PCT/FR83/00169, § 371 Date Apr. 20, 1984, § 102(e) Date Apr. 20, 1984, PCT Pub. No. WO84/00990, PCT Pub. Date Mar. 15, 1984
PCT Filed Aug. 17, 1983, Ser. No. 606,825
Claims priority, application France, Aug. 26, 1982, 82 14652
Int. Cl.⁴ A47C *19/00*
U.S. Cl. 4—223 **2 Claims**

1. A support device for solid treatment products which are dispersible or soluble in water and used in block form, for positioning under the rim of a water closet (WC) bowl comprising:
an elongated enclosure, having a bottom and a longitudinal axis, containing at least one solid treatment block; means to protect said block against direct erosion thereof by flow of water from a WC bowl, said protecting means being a cover fitted to said enclosure;
a deferred action discharge means for directing a predetermined volume of diluted liquid medium into a WC bowl, said deferred action discharge means including at least two siphon systems longitudinally spaced on opposed ends of said enclosure;
a vertical wall integral with said cover extending across the longitudinal axis of said enclosure and extending towards but spaced from the bottom of said enclosure into two compartments containing in one of said compartments said siphon systems and in the other of said compartments, said at least one block, said other of said compartments having its upper end closed by said cover;
means for admitting into said enclosure a predetermined volume of flushing water, said admitting means being



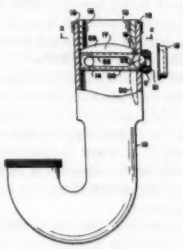
positioned in said cover over said compartment containing said siphon systems, and including at least one bowl means for retaining a fraction of the flushing water with the remainder of the flushing water being directed into a WC bowl, and at least one metering orifice formed in said bowl means; and
means to hold said enclosure under the rim of a WC bowl.

4,555,820

DRAIN PIPE SYSTEM

John A. Dragstrem, 1845 Hawaii Dr. E., Jacksonville, Fla. 32216

Filed Jan. 30, 1984, Ser. No. 575,014
Int. Cl.⁴ E03D *11/00*
U.S. Cl. 4—256 **16 Claims**



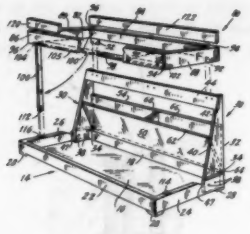
1. In a drain pipe system having an upstream end and a downstream end the improvement which comprises a closeable side inlet pipe adjacent the upstream end thereof and having means to connect to a water source a flap valve having a flap pivotably connected adjacent said inlet pipe, said flap valve being positioned upstream of said side inlet pipe such that said flap hangs downwardly by the force of gravity with its surface normally convering a substantial portion of said side inlet opening, and a removably insertable anti-backflow device adapted to be inserted into said side inlet pipe and to close automatically to prevent any flow drainage from the drain pipe system outwardly through said side inlet pipe, said anti-backflow device being shaped such that when inserted through said side inlet pipe it will force said flap to be closed thereby closing the drain pipe system and when removed it will permit said flap to be open against the inside of and to open the said drain pipe system.

4,555,821

SOFA-BUNK BED COMBINATION

Elwin H. Page, 2810 E. 26th St., Brooklyn, N.Y. 11235

Filed Apr. 30, 1984, Ser. No. 605,598
Int. Cl.[4] A47C *17/32, 17/37*
U.S. Cl. 5—9 R **11 Claims**



1. A sofa-bunk bed combination comprising:

a bottom unit, comprising a bottom support for defining a bottom bunk-sofa seat; the bottom support having a front side, a rear side and two lateral sides between the front and rear sides;

upright elements at the lateral sides of the bottom support toward the rear side thereof;

an upper unit comprising an upper support for serving as an upper bunk when the combination is in the bunk bed mode and for serving as a sofa seat back when the combination is in the sofa mode; the upper support also having a respective rear side, an opposite front side, and two lateral sides between the front and rear sides; a hinge connection extending from the upper support and to the upright side elements of the bottom unit for enabling pivoting of the upper unit between the bunk bed mode, wherein the upper support is upraised horizontally, and the sofa mode, wherein the upper support is suspended down, such that the front side of the upper support is down toward the lower support;

the upper support being non-foldable, whereby it maintains the same dimensions when it is in the bunk bed mode and when it is extending downward in the sofa mode; during pivoting of the upper support between the upraised bunk bed mode and the downwardly inclined orientation in the sofa mode, the bottom support remaining stationary and nonshifting;

legs attached to the upper support and extending down from the upper support toward the bottom support; means on the bottom support for receiving and holding the ends of the legs extending down from the upper support toward the bottom support;

a storage unit for storage therein of objects, the storage unit being supported to the upright side elements and having a front side including a front wall extending across the storage unit front side, closing off that front side, and projecting forwardly toward the front side of the bottom support; the shape of the storage unit front wall being correlated to the orientation of the downwardly inclined upper support, such that when the upper support is in the sofa mode, the front wall of the storage unit does not interfere with the upper support moving into the sofa mode.

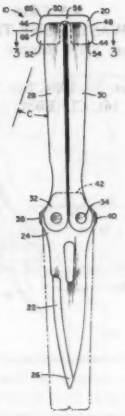
4,555,822

KNIFE SYSTEM WITH REMOVABLE-ACCESSORY HANDLE LOCK

Philip V. Miceli, 1900 Shanklin Ave., Baltimore, Md. 21234

Filed Nov. 14, 1984, Ser. No. 671,248
Int. Cl.[4] B26B *11/00, 29/02;* **F41B** *13/04*
U.S. Cl. 7—119 **5 Claims**

1. In a system of folding pocket tool of the type having blade with butt end and point end, paired handles with first and second ends and with "U"-sections forming in each handle a groove along one side open at the second ends and a spine along the other side, means pivoting first ends to the handles to the butt end of the blade for encasing an edge of the blade in the grooves for storage and for swinging around to a use-position with the blade exposed and the spines of the handles together for gripping and means for holding the spines together detachably, the means for holding comprising: a plate having first and second legs and a connection, therebetween



forming a slot with an open end and a closed end, the plate proportioned for force-fit into the second ends of the handles with a portion of each said spine received in said slot, said proportion for force-fit including said legs bearing on the handles in said respective grooves and resiliently biasing the handles together, and means adapting the plate for use as a scraper blade, including the plate being of tempered steel of uniform thickness and proportioned for protruding as a scraper blade at the second ends of the handles.

4,555,823

MACHINE FOR THE AUTOMATIC CARDING OF UPPERS FOR FOOTWEAR

Gaetano Pedretti, Vigevano, and Paolo Marazzi, Torlino Vimercati, both of Italy, assignors to Cerim, S.P.A., Torlino Vimercati, Italy

Filed Aug. 22, 1983, Ser. No. 525,558
Claims priority, application Italy, Aug. 30, 1982, 23043 A/82
Int. Cl.[4] A43D *95/00;* **C14B** *1/44*
U.S. Cl. 12—77 **17 Claims**

1. A machine for the automatic carding of uppers for footwear, comprising:

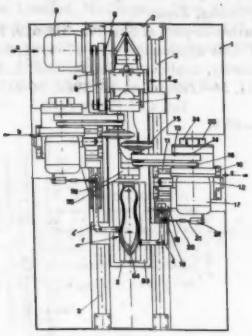
a bedplate provided with longitudinal guides, said bedplate having a symmetry axis;

a carriage moving along said longitudinal guides and means associated with said carriage for positioning and locking a last with its uppers, and having a system for positioning and locking a template stack;

a first tool-holder unit, fixedly connected to said bedplate and provided with a rocking arm supporting a tool at its free end, and with a system to control the approach and to regulate the pressure;

two similar tool-holder units, movable at a right angle relatively to said symmetry axis of said bedplate provided with said longitudinal guides along which said carriage slides, and symmetrically positioned with reference to said symmetry axis of said bedplate; each said tool holder unit including a rocking arm supporting said tool, and a system to regulate the pressure between said tool and upper;

a profile-copying "tracking" system including a template, a transducer, a feeler pin sliding on said template, and an electronic microprocessor, said profile-copying tracking



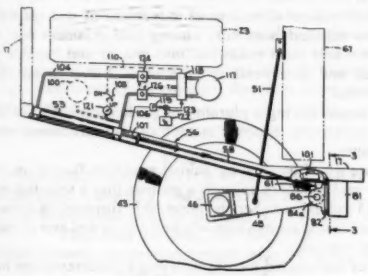
system actuating the movement of each movable toolholder unit, according to the signal given by said feeler-pin sliding on said template, by way of said transducer and said electronic microprocessor.

4,555,824

DEBRIS COLLECTION SYSTEM FOR STREET SWEEPERS

Richard B. Rosseau, Claremont, Calif., assignor to FMC Corporation, Chicago, Ill.

Division of Ser. No. 431,959, Sep. 30, 1982. This application May 31, 1984, Ser. No. 615,659
Int. Cl.[4] E01H *1/04*
U.S. Cl. 15—87 **3 Claims**



1. In a street sweeping machine having a framework, a floating support apparatus for a driven sweeping brush adapted for contact with an underlying surface to be swept, wherein said sweeping brush is a gutter brush, comprising

a substantially vertical shaft attached to the framework,

a brush arm adapted to carry a driven gutter brush, said arm having a bore therethrough at one end for receiving said substantially vertical shaft,

a set of ball bushings disposed within said bore and configured to engage said shaft, whereby the brush arm may move up and down thereon,

means for providing infinitely variable positioning of an adjustable member extending from the framework within a range between fully extended and fully retracted positions of said adjustable member,

a spring means coupled at one end to said adjustable member,

means for coupling the other end of said spring means to said brush arm, and

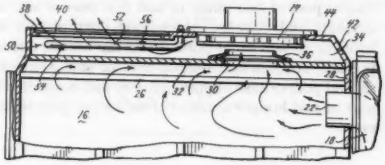
means for controlling said means providing infinitely variable positioning so that said brush arm is moved between a raised carrying position and various lowered brushing positions, whereby gutter brush pressure on the underlying surface to be swept is adjustable.

4,555,825

HYDRAULIC COOLING SYSTEM FOR VACUUM STREET SWEEPER

Karel W. M. Van Raaij, Pettemerstraat 17-23, P.O. Box 286, 1800 AG Alkmaar, Netherlands

Filed Feb. 10, 1984, Ser. No. 579,168
Int. Cl.[4] E01H *1/08*
U.S. Cl. 15—339 **10 Claims**



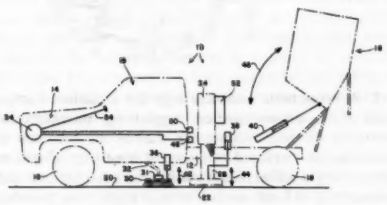
1. In a vacuum street sweeper having at least one hydraulically driven component, a vacuum system with an exhaust section, the exhaust section including a compartment, a vacuum blower housed in the compartment for suctioning air carrying debris and dust, and an exhaust port from the compartment serving as an outlet for air to the atmosphere, filter means immediately upstream of the exhaust port for filtering air prior to its passage through the exhaust port, hydraulic oil conduit means, means for mounting the hydraulic oil conduit means adjacent and upstream of the filter means for utilizing otherwise wasted exhaust air from said blower for cooling hydraulic oil prior to passage of the air through the filter means.

4,555,826

HYDRAULIC CONTROL SYSTEM FOR VACUUM SWEEPER TRUCKS

Jack Rodgers, P.O. Box 1033, Redding, Calif. 96099, and Mark F. Rodgers, 3745 Churn Creek Ave., #1, Redding, Calif. 96001

Filed Jul. 3, 1984, Ser. No. 627,429
Int. Cl.[4] E01H *1/08*
U.S. Cl. 15—340 **7 Claims**



1. A hydraulic control system for a vacuum sweeper truck of the type including an internal combustion engine for propelling said truck, a cab within which the vehicle operator may sit, a vacuum pick-up head, a rotary sweeper mechanism for directing refuse to said vacuum pick-up head, and a dumping hopper movable between a loading and a dumping position, said hydraulic control system comprising:

a hydraulic pump having an input port and an output port,

said hydraulic pump being coupled to said internal combustion engine;

a reservoir of hydraulic fluid having an output port coupled to said input port of said hydraulic pump;

a hydraulic fan motor adapted to power a vacuum pump which provides vacuum to said vacuum pick-up head, said fan motor having an input port and an output port, said output port of said fan motor being coupled to an input port of said reservoir;

a hopper actuator having a pair of ports, where applying pressure to a first port causes said hopper to move towards said dumping position and where applying pressure to a second port causes said hopper to move towards said loading position; and

first valve means having three operative positions, where a first position couples said output port of said pump to said input port of said fan motor, a second position couples said output port of said pump to said first port of said hopper actuator and couples said second port of said hopper actuator to said input port of said fan motor, and a third position couples said output port of said pump to said second port of said hopper actuator and couples said first port of said hopper actuator to said input port of said fan motor.

4,555,827

CONVERTIBLE CABINET SUPPORT

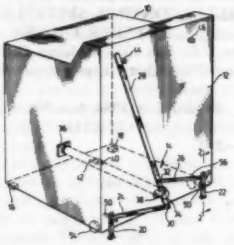
Robert M. St. Louis, St. Leonard, Canada, assignor to Camco Inc., Toronto, Canada

Continuation of Ser. No. 521,366, Aug. 8, 1983, abandoned. This application Apr. 5, 1985, Ser. No. 719,646

Claims priority, application Canada, Sep. 10, 1982, 411175

Int. Cl.[4] B60B *33/06*

U.S. Cl. 16—34 **13 Claims**



1. A retractable undercarriage for a cabinet comprising at least three interconnected supporting members moveably mounted on said cabinet for movement between extended position and retracted position, at least one of said members comprising a wheel means positioned adjacent one end of said cabinet and at least another of said supporting members being leg means for supporting said cabinet in a fixed position and located adjacent an opposite end of said cabinet from said one end, means for moving both said wheel means and said leg means relative to said cabinet including means interconnecting said wheel means and said leg means to move said wheel means to said extended position while substantially simultaneously moving said leg means to retracted position, and to move said leg means to extended position while substantially simultaneously moving said wheel means to retracted position.

4,555,828

GUIDING SYSTEM FOR MOVABLE SUSPENDED PARTITION WALLS

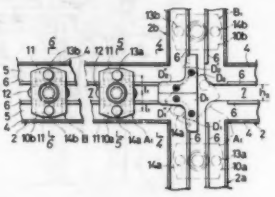
Tugumi Matimura, Osaka, Japan, assignor to Itoki Kosakusho Co., Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 328,629, Dec. 8, 1981, abandoned. This application Apr. 27, 1984, Ser. No. 604,577

Claims priority, application Japan, Dec. 8, 1980, 55-173579; May 29, 1981, 56-82996; Jun. 16, 1981, 56-93365

Int. Cl.[4] E05D *13/02*

U.S. Cl. 16—95 R **7 Claims**



1. A guiding system for movable suspended partition walls comprising

at least one hollow main guided rail,

at least two spaced, hollow branch guide rails each extending at an angle and to one side of said main guide rail,

said main and branch guide rails defining at least two directional change points therebetween,

each of said main and branch guide rails having a longitudinally extending open passageway on its underside,

a plurality of retainers disposed within said main and branch guide rails so as to be freely movable along said open passageway, and suspending therefrom a plurality of partition walls each of which is relatively movable about a vertical suspension bar which extends upwards from each of said partition walls into said main and branch guide rails and is rotatably supported by a relevant one of said retainers,

means to select directions of movement of said retainers so that selected ones only among said retainers can move from said main guide rail into one of said branch guide rails and vice versa at each of said directional change points,

said means having a plurality of guide means, one of which is selectively disposed at each of said directional change points,

a plurality of upstanding guided members fixedly mounted on said retainers, in such a manner that a selected one of said guided members is immovably disposed in operation and located on one side of a vertical swivel axis of each of said retainers,

each of said guided members having a predetermined height that enables each of said guided members to contact only a pre-selected one of said guide means at a pre-selected one of said directional change points and freely pass underneath any other preceding one of said guide means at any preceding one of said directional change points,

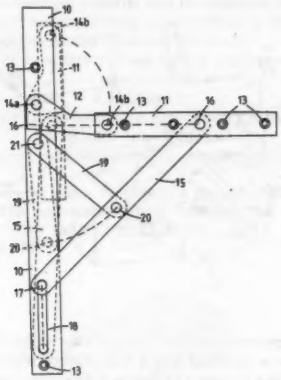
each of said guide means having a first guiding part fixedly mounted on said guide means which is contacted by an inner side portion, a portion adjacent to a center line of said open passageway, of a pre-selected one of said guided members, and a second guiding part fixedly mounted on said guide means which is contacted by a front portion, as viewed in a direction of advance of said retainers, of said pre-selected one of said guided members, when said pre-selected one of said guided members comes into contact with a cooperating one of said guide means, and

a level of contact between said guided members and said guide means at a first one of said directional change points is higher than that at a second one of said directional change points.

4,555,829
SUPPORTING STAYS FOR SWINGABLE WINDOWS HAVING FRICTION AND SLIDING PIVOTS

Ronald P. Davis, Wellington, New Zealand, assignor to Interlock Industries Limited, Wellington, New Zealand

Filed Dec. 9, 1983, Ser. No. 559,877
Claims priority, application New Zealand, Dec. 9, 1982, 202754; Mar. 14, 1983, 203553
Int. Cl.⁴ E05D *11/08, 15/32*
U.S. Cl. 16—342 **8 Claims**

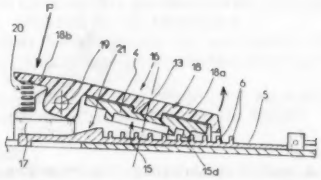


1. A window stay comprising a pair of mounting plates, one being adapted for mounting to a window frame and the other being adapted for mounting to a window sash, said frame and sash mounting plates being coupled together by first and second arms, said first arm being shorter than said second arm, each of said first and second arms being pivotally connected to said sash mounting plate and said first arm being pivotally connected at a fixed point to said frame mounting plate, there being a third arm pivotally connected to said second arm, one of said second arm and said third arm being pivotally connected at a fixed point to said frame mounting plate and the other of said second and third arms being pivotally and slidingly connected to said frame mounting plate for sliding movement in a substantially longitudinal direction along said frame mounting plate.

4,555,830
ADJUSTMENT DEVICE FOR A SKI BOOT

Roland Petrini, Chambéry, and Jean-Louis De Marchi, Duingt, both of France, assignors to Salomon S.A., Annecy, France

Filed May 31, 1984, Ser. No. 615,637
Claims priority, application France, May 31, 1983, 83 08986
Int. Cl.⁴ A43C *11/00*
U.S. Cl. 24—68 SK **8 Claims**



1. Device for progressive adjustment of the relative positions of first and second elements to control the tension of a connecting element, comprising

(a) a support (3; 16) solid with said first element (1) and comprising a cap shaped base (17) on which is articulated, about a horizontal and transverse axis, a cover (18) in the form of a lever having large and small branches (18*a*, 18*b*),

(b) a rack (5) having a succession of teeth (6) of constant pitch (a), solid with said second element (2) and engaged in said support (3; 16); and

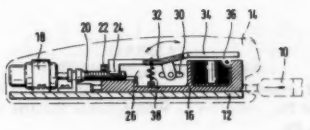
(c) a control knob (4) rotatably mounted on said support (3; 16) on a lower face of said large branch (18*a*) above said rack (5) and having, on its lower face turned toward said rack (5) a spiral rib (15) centered on the rotational axis (xx') of said control knob (4), said control knob being biased by spring means (20) such that a portion of said spiral rib (15) is selectively engaged and disengaged between said teeth (6) of said rack (5) by pivoting movement of said cover, said spiral rib extending over an arc of at least 360° and having a spacing between its turns substantially equal to the spacing between said teeth (6);

(d) said rotational axis (xx') being inclined, relative to the plane of said rack, at an angle such that, in all angular positions of said spiral rib (15), a small portion (15*a*) only of the latter is engaged between successive teeth of said rack (5), while a diametrically opposite portion of said spiral rib is located above a plane passing through the crests of said teeth (6) of said rack.

4,555,831
CATCH FOR SAFETY BELTS OF AIR, WATER, AND LAND TRANSPORT MEANS

Uwe Otzen, Eisenbahnstr. 16, 7210 Rottweil, and Karl Wild, Mariazeller Str. 5, 7230 Schramberg, both of Fed. Rep. of Germany

Filed Apr. 27, 1983, Ser. No. 489,108
Claims priority, application Fed. Rep. of Germany, May 7, 1982, 3217082; Sep. 17, 1982, 3234486
Int. Cl.⁴ A44B *11/26*
U.S. Cl. 24—603 **8 Claims**



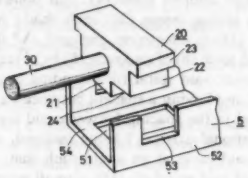
1. An improved catch for safety belts of air, water and land transport means embodying releasable locking of the catch tongue with a releasing element which by means of a pushbutton is manually movable to slide in a forward direction counter to the force of a return spring and at the end of its movement path releases a locking mechanism, and further embodying an automatic release system controllable by an electric signal generated by a sensor and having an electromechanical drive which subjects the releasing element to traction in said forward direction, the automatic release operation occurring in response to the electric signal generated by the sensor after a given delay period, such delay period starting anew after each signal if several signals occur successively within the delay period, comprising: an electro-mechanical drive in the form of a gear motor having a threaded spindle (20, 122) rotatable thereby; a drag nut (24,124) provided on the threaded spindle and bearing against said releasing element; said drag nut being movable in said forward direction by the rotation of said spindle to thereby slide said releasing element to the end of its movement path to release said locking mechanism, said drag nut releasing said releasing element for movement by said pushbutton; and a switching element (40, 36, 132) which upon release of said locking mechanism acts on the gear motor (18, 118) to restore it to its starting condition prior to the electric signal generated by said sensor.

4,555,832

BUCKLE ASSEMBLY

Yasumasa Sano, Kanagawa, and Tetsuya Ohwada, Chiba, both of Japan, assignors to NSK-Warner K.K. and Nippon Kinzoku Co., Ltd., both of, Japan

Filed Jun. 2, 1983, Ser. No. 500,442
Claims priority, application Japan, Jun. 10, 1982, 57-86347[U]
Int. Cl.[4] A44B *1/18*
U.S. Cl. 24—682 3 Claims



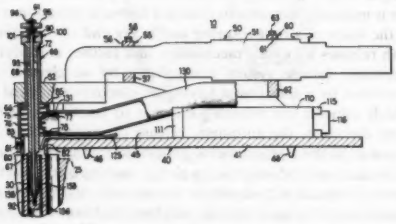
1. A buckle assembly comprising a clinched anchor block fixedly secured on a wire and having a base portion, a stepped down interlocking portion projecting downwardly therefrom, and a pair of stepped up side projections; and a buckle base having a bottom wall with a window and a pair of upstanding side walls, each side wall having a notch in an upper portion thereof; the interlocking portion of the clinched anchor block being press-fitted in the window of the buckle base and the side projections being press-fitted in the notches, whereby the base portion of the anchor block rests on the bottom wall and the stepped ends of the base portion abut against the side walls.

4,555,833

MECHANICAL PLUG DRILL

Phillip J. Hawkins, Penn Hills, and Edward J. Choby, Irwin, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 12, 1984, Ser. No. 588,422
Int. Cl.[4] B23B *45/04*
U.S. Cl. 29—33 T 20 Claims



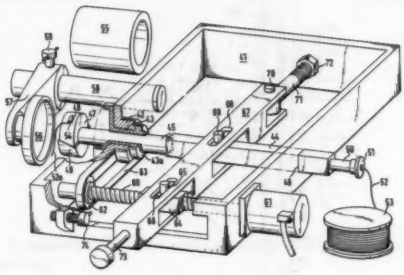
1. A device for removing plugs from plugged tubes in a stream generator, said device comprising a frame, a drill bit mounted on said frame and movable with respect thereto from a storage position to an operating position, motor means mounted on said frame for rotating said drill bit, means for introducing an air-water mixture near where said drill bit meets the plug to be drilled, and collection means connectable to a source of low pressure for collecting and removing the air-water mixture and any debris entrained therewith due to drilling the associated plug.

4,555,834

CONNECTOR FITTING WITH AN ELECTRICAL HEATING WIRE

Wolfgang Sichler, Sinsheimer Str. 20, D-6800 Mannheim 61, Fed. Rep. of Germany

Filed Feb. 3, 1983, Ser. No. 463,514
Claims priority, application Fed. Rep. of Germany, Feb. 11, 1982, 3204681
Int. Cl.[4] B23Q *5/40*
U.S. Cl. 29—33 K 8 Claims



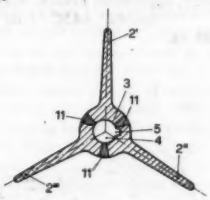
1. An apparatus for producing a resin sleeve fitting having a heating wire recessed into a face thereof whereby it may be joined with a structure by fusion welding the resin, comprising a support unit for the fitting, a cutting head, a cutting head support therefor adapted to extend into the sleeve fitting from at least one end thereof, a cutter on said head said cutter being shaped to from a cut having lip-like edges and to temporarily spread apart said edges; an element associated with said cutter for placing a heating wire in the cut formed by said cutter; means for pressing said edges of the cut down over the heating wire for holding the heating wire in place threaded means on said head, a lead screw engaging said threaded means for transmitting the motion of the threaded means to the cutting head for moving said cutter lengthwise of the fitting for cutting a helical slit in the interior face of the fitting.

4,555,835

PROCESS FOR PRODUCING PROPELLERS

Fabio Buzzi, Annone Brianza, and Emilio Riganti, Solbiate Arno, both of Italy, assignors to Innocente Riganti Officine Meccaniche S.p.A., Solbiate Arno, Italy

Filed Dec. 22, 1983, Ser. No. 564,510
Claims priority, application Italy, Jan. 7, 1983, 19028 A/83
Int. Cl.[4] B21K *3/00*; B23P *15/00*
U.S. Cl. 29—156.8 R 10 Claims



1. A method of fabricating a marine engine propeller of a desired shape and size and with n individual propeller blades each integral with a central hub having a circular crown and an aperture adapted to permit attachment to the propeller shaft of a marine engine, said propeller blades each having a hub segment the vertex angle of which between lateral edges is 360°/n, comprising the steps of

press-forging each of said n blades from blanks within a

forging press comprising a press-forging mold having at least one recessed impression portion which substantially conforms to the size and shape of the desired blades;

beveling the surfaces of said lateral edges over a length at least equal to the thickness of the circular crown of the hub of the propeller;

arranging said blades in radial fashion with a beveled edge surface of each blade substantially abutting the beveled edge of each adjacent blade;

welding each of the n hub segments to adjacent segments by applying a welding material into the channels formed by the adjacent beveled lateral edge surfaces to form a one piece propeller having a central hub; and

forming a center aperture in the hub of said propeller.

4,555,836

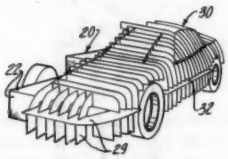
METHOD OF MAKING A PROTOTYPE FROM CONCEPT DRAWINGS

Ronald C. Martin, 4634 Ashburton Pl., Sterling Heights, Mich. 48077

Continuation-in-part of Ser. No. 544,032, Oct. 24, 1983, Pat. No. 4,474,722. This application Feb. 2, 1984, Ser. No. 576,511

Int. Cl.⁴ B21D *39/00*

U.S. Cl. 29—428 **10 Claims**



1. A method of making a prototype pattern from design concept drawings comprising:

constructing a frame;

tracing and taking measurements from design concept drawings;

cutting a plurality of thin sheets of substantially rigid material in accordance with planar sections of said drawings, said planar sections lying in a variety of orientations at specified intervals;

assembling said sheets together and to the frame in the same orientation and at the same intervals as the planar sections of the drawings to form a skeletal model;

disassembling the skeletal model into separate sheets;

tracing the contour of the sheets on pattern pieces of easily shaped material, said pattern pieces being a thickness corresponding to the interval between adjacent sheets;

assembling the pattern pieces together and onto the frame to form a rough design pattern; and

shaping the rough design pattern to the desired contour of the prototype pattern.

4,555,837

METHOD OF MAKING AN IMPROVED WATER HEATER TANK ASSEMBLY

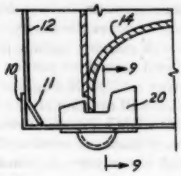
Paul G. Daugirda, Evergreen Park, Ill., and Keith R. Clark, Montgomery, Ala., assignors to Rheem Manufacturing Company, New York, N.Y.

Division of Ser. No. 427,530, Sep. 29, 1982, Pat. No. 4,452,226. This application Dec. 29, 1983, Ser. No. 566,877

Int. Cl.⁴ B23P *11/00*

U.S. Cl. 29—432.1 **6 Claims**

1. A method of forming a support means for supporting a storage tank and a base member in vertically spaced relationship, said method comprising the steps of forming a plurality of support members by folding a blank about a fold line to provide a support member with a pair of mutually perpendicular webs, applying an edge surface of one of said webs of each of said support members to said base member in a predetermined arrangement so that said other web member of each of said support members extends generally parallel to said base member, and forcing each of said support member toward said base member to cause said one web of each of said support members



to pierce said base member and protrude above said member to provide an arrangement of a plurality of peripheral supports for said tank.

4,555,838

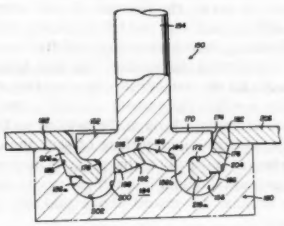
METHOD OF INSTALLING SELF-ATTACHING FASTENERS

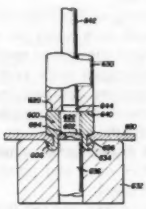
Rudolph R. M. Müller, Frankfurt, Fed. Rep. of Germany, assignor to Multifastener Corp., Detroit, Mich.

Continuation-in-part of Ser. No. 485,099, Mar. 28, 1983, Pat. No. 4,459,073, and a continuation-in-part of Ser. No. 504,074, Jun. 14, 1983, which are, respectively, a division and continuation of Ser. No. 229,274, Jan. 28, 1981, abandoned. This application Dec. 21, 1983, Ser. No. 563,833

Int. Cl.⁴ B23P *11/00*

U.S. Cl. 29—432.1 **27 Claims**





1. A method of attaching a fastener to a plastically deformable panel, said fastener including a body portion and a self-piercing and riveting annular wall extending from said body portion, said annular wall having an outer surface, an inner surface, a free open end portion and a piercing surface adjacent said inner wall surface and free end portion, said annular wall free end portion having an arcuate annular surface at said outer surface, the method comprising:

(a) locating said fastener opposite said panel with said annular wall free end portion facing said panel and a die member located on the opposite side of said panel, said die member having an annular concave die cavity surround-

ing a projecting central die portion which is coaxially aligned with and telescopically receivable within said fastener annular wall opening;

(b) engaging said panel with said fastener annular wall free end, said fastener arcuate surface deforming said panel into said annular concave die cavity;

(c) said annular wall piercing surface piercing a slug from said panel and said central die portion receiving, supporting and centering said panel slug and carrying said slug into said annular wall opening;

(d) plastically deforming said annular wall free end radially outwardly in said concave annular die cavity, forming said annular wall free end into an annular bead comprising a generally U-shaped channel in cross-section, said channel opening toward said fastener body portion and the pierced edge of said panel; and,

(e) plastically deforming said pierced panel edge against said annular wall outer surface into said generally U-shaped channel, forming a mechanical interlock between said self-piercing and riveting annular wall and said panel.

25. A method of attaching a self-fastening member to a plastically deformable panel, said self-fastening member including a base portion having a side surface and a bottom surface, an annular wall integrally joined to said base portion bottom surface spaced inwardly from said base portion side surface, and said annular wall having a free open end portion, the method comprising:

(a) locating said self-fastening member opposite said panel with said annular wall free end portion facing said panel and a die member located opposite said panel, said die member having an annular die cavity surrounding a central projecting die portion and said die member having a relatively flat panel supporting shoulder on opposite sides of said die cavity, the free end of said central die portion coaxially aligned with and telescopically receivable in said self-fastening member annular wall free open end portion and said central die portion free end spaced below the plane of said die member shoulder, said central die portion having a relatively smooth arcuate concave outer die surface extending through the bottom surface of said die cavity, and the outer surface of said annular die cavity including an inwardly inclined die surface extending from adjacent said shoulder into said die cavity and terminating in an annular lip spaced above said die cavity bottom surface;

(b) supporting said panel on said die member shoulder in fixed relation; and,

(c) relatively moving said self-fastening member and said die member toward each other to perform the following method steps in a continuous operation;

(1) engaging said panel with said self-fastening member annular wall free end and piercing said fastener free end through said panel and plastically deforming said panel into said annular die cavity,

(2) telescopically disposing said central die portion into said annular wall free open end portion through an opening pierced in said panel,

(3) plastically deforming said self-fastening member annular wall free end radially outwardly against said die member central portion arcuate concave outer die surface, and plastically deforming the panel portion adjacent said opening into said die cavity against the outer surface of said annular wall, and

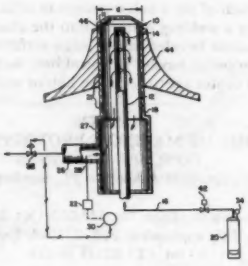
(4) plastically deforming said self-fastening member annular wall free end radially outwardly into a U-shaped channel in cross-section opening toward said member base portion through said die cavity bottom surface and simultaneously driving said self-fastening member base portion into said panel and counter rotating said panel portion in the developing U-shaped channel of said annular wall free end, forming a mechanical interlock between said annular wall and said panel portion.

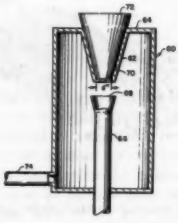
4,555,839

METHOD OF INTERFERENCE-FITTING MALE AND FEMALE MEMBERS

Scott W. Thurber, Allentown, Pa., assignor to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Jul. 8, 1982, Ser. No. 396,187
Int. Cl.[4] B23P *11/02*
U.S. Cl. 29—450 **10 Claims**





1. A method of fitting a resilient non metal workpiece having a glass transition region at cold temperatures to a second workpiece by means of an interference fit which comprises forcing at least a portion of said resilient workpiece into contact with a hollow mandrel closed at one end thereof to elastically stressed said portion, passing within said hollow mandrel a refrigerant at a temperature at least as cold as the glass transition temperature of said elastically stressed resilient workpiece thereon, removing said resilient workpiece from said mandrel after at least a period of time required for said portion in contact with said mandrel to cool to at least its glass transition temperature to retain said elastically stressed condition, combining in telescopic arrangement said cooled elastically stressed resilient and second workpieces so than at least said portion is in telescopic contact with said second workpiece, and raising the temperature of said portion to above its glass-transition temperature to effect the interference fit by allowing said portion of said resilient workpiece to return toward its ambient temperature unstressed shape in interference contact with said second workpiece.

4,555,840

PROCESS FOR POSITIONING AND ALIGNING DIES

Iwao Nakamura, Mobara, Japan, assignor to Futaba Denshi Kogyo K.K., Mobara, Japan

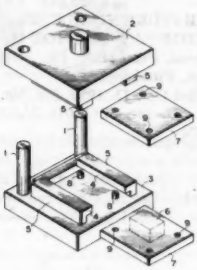
Division of Ser. No. 211,850, Dec. 1, 1980, Pat. No. 4,397,094. This application Mar. 30, 1983, Ser. No. 480,283
Claims priority, application Japan, Dec. 1, 1979, 54-154985
Int. Cl.[4] B23Q *3/00*
U.S. Cl. 29—465 **1 Claim**

1. A process for accurately locating and aligning dies with respect to a pair of upper and lower die fixtures having locating pins, said process comprising the steps of:

uprightly mounting guide posts in openings of one of a pair

of base plates by inserting ends of the guide posts into said openings of the base plate, said openings of said one base plate being positioned such that said locating pins of one of said die fixtures fit therein when said one of said base plates is mounted thereon;

mounting a remaining one of said pair of the base plates for vertically reciprocal movement on the uprightly erected guide posts by slidably inserting the other ends of said guide posts into openings of said remaining base plate of said pair of base plates, thereby assembling a pair of the base plates in the form of a die set accurately aligning the openings of the respective base plates, said openings of



said remaining base plate being positioned such that said locating pins of another of said die fixtures fit therein when said remaining base plate is mounted thereon;

locating said dies in said pair of said base plates assembled in the form of said die set for accurately aligning each of the dies, and securing said dies to respective ones of said base plates in defined locations thereof;

mounting said one base plate to said one die fixture with said pins of said one die fixture inserted in said holes of said one base plate; and

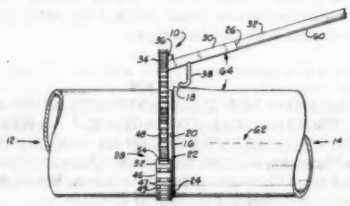
mounting said remaining base plate to said another die fixture with said pins of said another die fixture inserted in said holes of said remaining base plate.

4,555,841

PIPE ALIGNING TOOL

Benny R. James, Valliant, Okla., assignor to Alton C. Harris, Pascagoula, Miss.

Filed Mar. 30, 1983, Ser. No. 480,261
Int. Cl.⁴ B23Q *3/00*
U.S. Cl. 29—468 **5 Claims**



1. A pipe aligning tool for alignment of incompletely aligned ends of a first pipe and a second pipe in a partially secured abutting end-to-end relationship, to facilitate completion of their being secured together, comprising:

a lever having first and second opposite ends;

means for strapping the first end of said lever to the first pipe near but axially spaced from the end of the first pipe at a position opposing a section of the second pipe having a protrusion not aligned with the end of the first pipe; and

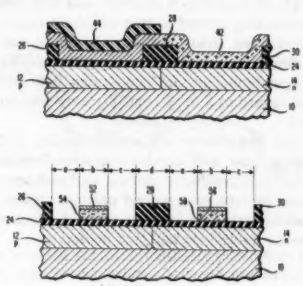
means, rigidly fixed to the lever near the first end of the lever, for pressing the protrusion of the second pipe into alignment with the end of the first pipe by applying a force to the second end of the lever.

4,555,842

METHOD OF FABRICATING VLSI CMOS DEVICES HAVING COMPLEMENTARY THRESHOLD VOLTAGES

Hyman J. Levinstein, Berkeley Heights, and Sheila Vaidya, Bridgewater, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Mar. 19, 1984, Ser. No. 591,274
Int. Cl.⁴ H01L *21/265, 21/22, 29/78*
U.S. Cl. 29—571 **25 Claims**



1. A method of fabricating a CMOS device of the type that comprises substantially complementary-threshold-voltage NMOS and PMOS transistors which include silicide-on-doped polysilicon gates, said method comprising the steps of

forming a polysilicon layer on a substrate,

introducing p-type dopants only into regions of said layer from which PMOS-transistor gates are to be formed,

driving substantially all of said dopants into lattice sites in said regions of said layer,

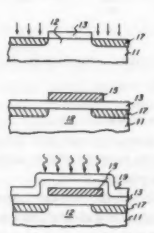
and subsequently forming a silicide precursor layer on said polysilicon layer.

4,555,843

METHOD OF FABRICATING DENSITY INTENSIVE NON-SELF-ALIGNED STACKED CMOS

Satwinder D. S. Malhi, Garland, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Apr. 27, 1984, Ser. No. 604,804
Int. Cl.⁴ H01L *21/88, 21/20, 21/283*
U.S. Cl. 29—571 **5 Claims**



1. A method of fabricating stacked field effect semiconductor devices with channel length L, channel width W and with

a maximum patterning alignment error S, comprising the steps of:

(a) patterning first source and drain regions in a semiconductor substrate, said first source and drain regions of width W and defining a first channel region in said substrate of length L and width W,

(b) forming a first insulating layer on said substrate and covering said first channel region,

(c) patterning a conducting strip of width of L+2S on said insulating layer, said conducting strip oriented perpendicular to said length L of said first channel region and aligned without regard to S to centrally cover said first channel region,

(d) forming a second insulating layer on said conducting strip and connecting to said first insulating layer,

(e) patterning a semiconducting strip of width W on said insulating layers, said semiconducting strip oriented parallel to said length L of said first channel region and aligned without regard to S to cover said first channel region,

(f) patterning second source and drain regions in said semiconducting strip, said second source and drain regions defining a second channel region of length L oriented perpendicular to said conducting strip and aligned without regard to S to be centrally over said conducting strip, and

(g) said first source and drain regions, said first channel region, and said conducting strip forming a first field effect semiconductor device, and said second source and drain regions, said second channel region, and said conducting strip forming a second field effect semiconducting device stacked on said first device.

4,555,844

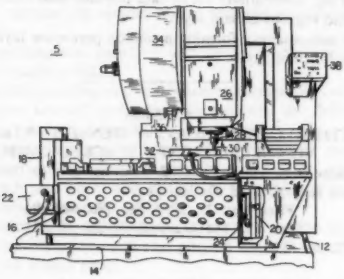
PART TURNOVER ATTACHMENT FOR AUTOMATIC MACHINE TOOL

Kenneth J. Palfery, Toronto; John S. Malcolm, Schomberg, and Kenrick B. Maharaj, Brampton, all of Canada, assignors to McDonnell Douglas Corporation, Long Beach, Calif.

Filed Dec. 14, 1984, Ser. No. 681,906

Int. Cl.[4] B23Q *3/157*

U.S. Cl. 29—568 **2 Claims**



1. A part turnover attachment for an automatic machine tool, comprising:

(a) A frame;

(b) A movable worktable means connected to the frame for supporting a workpiece and movable longitudinally and latitudinally to position the workpiece at a desired point in a horizontal plane;

(c) A rotatable spindle means connected to the frame in a disposition of vertical movement thereon for supporting and rotating a cutting tool at a predetermined speed rate to machine the workpiece;

(d) A tool changing means connected to the frame for storing cutting tools and exchanging the cutting tool supported in the rotatable spindle means with one of a multitude of different cutting tools stored therein;

(e) A part turnover attachment disposed to be stored in the tool changing means and supported by the rotatable spindle means for removing the workpiece from the movable worktable, turning the workpiece over, and returning the workpiece to the movable worktable;

(f) A programmable control means disposed to control the movable worktable means, the rotatable spindle means, the tool changing means, and the part turnover attachment for automatically turning the workpiece over on the movable worktable for machining on its opposite side.

4,555,845

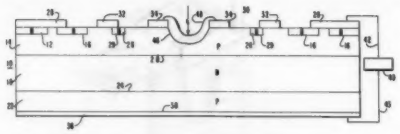
TEMPERATURE STABLE SELF-PROTECTED THYRISTOR AND METHOD OF PRODUCING

John X. Przybysz, Penn Hills, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 13, 1982, Ser. No. 434,192

Int. Cl.[4] H01L *21/66*

U.S. Cl. 29—574 **6 Claims**



1. A process for providing overvoltage self protection in a thyristor, said thyristor having a top and a bottom surface, said thyristor being comprised of a cathode emitter region, a cathode base region, said cathode base region being adjacent to said cathode emitter region, an anode base region, said anode base region being adjacent to said cathode base region, and an anode emitter region, said anode emitter region being adjacent to said anode base region, pn junctions between adjacent regions, said cathode base region extending from said top surface into said thyristor a predetermined first distance, said cathode emitter region being segmented and extending from said top surface into said cathode base region a predetermined second distance, said predetermined first distance being greater than said predetermined second distance, metal electrodes in ohmic electrical contact with said cathode emitter region, anode emitter region and one of said base regions, said process comprising: connecting a means for measuring the IV characteristic of the thyristor between the anode emitter electrode and the cathode emitter electrode of the thyristor, forming a well in a central portion of said one base region while continuing to monitor the IV characteristic of the thyristor and affixing a metal electrical contact in an electrical contact relationship with at least the bottom of said well and the metal electrode in ohmic contact with said base region.

4,555,846

METHOD FOR THE MANUFACTURE OF AN ELECTROCHEMICAL STORAGE CELL AS WELL AS A STORAGE CELL PRODUCED BY THIS METHOD

Stefan Mennicke, and Karl Reiss, both of Leimen-Gauangellock, Fed. Rep. of Germany, assignors to Brown, Boveri & Cie AG, Mannheim-Käfertal, Fed. Rep. of Germany

Filed Dec. 17, 1982, Ser. No. 450,765

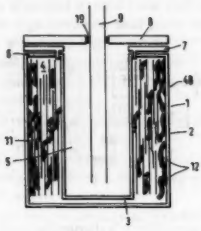
Claims priority, application Fed. Rep. of Germany, Dec. 21, 1981, 3150702

Int. Cl.[4] H01M *6/00*

U.S. Cl. 29—623.5 **6 Claims**

1. In a method for the manufacture of an electrochemical storage cell based on alkali metal and chalcogen with at least one anode space for the alkali metal anolyte and a cathode space for the chalcogen catholyte, with the anode space and

the cathode space separated from each other by an alkali ion conducting solid electrolyte, and with at least one cathodic current collector and one electron-conducting matrix material arranged in the cathode space, the improvement comprising inserting into the cathode space an anisotropic carbon or graphite felt made of coked pitch fiber with its principal fiber



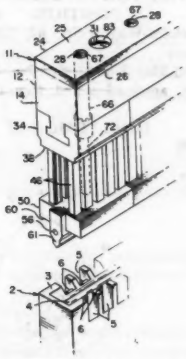
direction parallel to the solid electrolyte, impregnating the felt with a solution of a duromer dissolved in a solvent, disposing a major amount of said duromer in the vicinity of said cathodic current collector, and subsequently carbonizing the duromer at a temperature of between 500° and 1500° C. in the cathode space.

4,555,847

CONNECTOR INSERTION TOOL

Bryan J. Dornes, Hershey, and Robert J. Talarico, Camp Hill, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Jun. 11, 1984, Ser. No. 618,982
Int. Cl.⁴ H01R *43/00*
U.S. Cl. 29—739 **3 Claims**



1. A connector insertion tool for mounting to a press and mass inserting a plurality of contact pins depending from a connector into a printed circuit board, said tool being of the type comprising a body having a top surface and an opposed bottom surface, two rows of insertion fingers extending from said bottom surface, guide means slidably mounted on said fingers, shaft means fixed to said guide means and slidably received in bore means in said body, and spring means being effective to urge said guide means away from said body when said body is mounted to said press, characterized in that,

said tool is adapted for magnetic mounting of said top surface to said press, said shaft means comprising telescoping tube means slidably mounted in said bore means in said body and extendable from either surface thereof, said spring means comprising a coil spring mounted inside each said telescoping tube means,

said tube means being collapsed to load said spring in compression when said body is mounted to said press and said guide means is moved toward said bottom surface during insertion of said contacts,

said spring being effective to extend said tube means from said bottom surface to move said guide means away from said bottom surface when said body is mounted to said press during withdrawal of said tool after insertion,

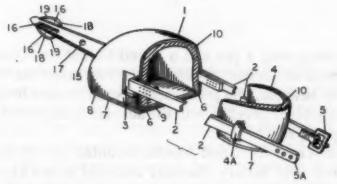
said spring being effective to extend said tube means from said top surface when said body is not mounted to said press and said guide means is moved toward said bottom surface.

4,555,848

DEFENSE WEAPON

Charles J. Schultz, 5860 Middle Fork Dr., Sparks Township, Washoe County, Nev. 89431

Filed Jan. 17, 1983, Ser. No. 440,082
Int. Cl.⁴ B26B *27/00*
U.S. Cl. 30—297 **1 Claim**



1. A defense weapon for an individual's protection against criminal attack, which said defense weapon comprises a toe boot that fits over and onto the front of the user's shoe, said toe boot having a long, substantially strong, forwardly extending bolt, with the forwardmost end of the bolt being brought to an exceedingly sharp point, said bolt then having attached around its circumference, a plurality of cutting blades, said bladed spike bolt then securely attached, by the use of an adapter, to the front of the toe boot, said toe boot, also having an interior, cushioning pad which protects the wearer's shoe, absorbs energy, and which also acts as a spacer, allowing a toe boot to fit either a left or right shoe, said toe boot also having a shoe sole attached to its exterior bottom, the bladed spike bolt, toe boot assembly then placed over and securely fastened onto the front of the wearer's shoe by the use of a strap and buckling device.

4,555,849

BATTERY POWERED PORTABLE SAW

Hiroyuki Ando; Toshio Tanabe, and Shinji Ihara, all of Hikone, Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

Filed Jun. 14, 1983, Ser. No. 504,064
Claims priority, application Japan, Jun. 21, 1982, 57-106339
Int. Cl.⁴ B23D *45/16*
U.S. Cl. 30—388 **3 Claims**

1. A battery powered portable electric circular saw having improved balance, comprising:

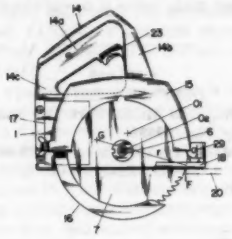
a housing having a generally vertical end wall defining a parallel saw blade compartment on one side thereof and a saw blade drive spindle rotatably supported to extend through said vertical wall;

a battery chamber and a motor chamber defined in said housing on the other side of said vertical end wall, an electric motor in said motor chamber having its output shaft generally perpendicular to said vertical end wall, with the center of said shaft being forward and above the center of said drive spindle in relation to the advancing direction of the saw blade;

gear reduction means drivingly interconnecting said motor output shaft and said drive spindle;

said battery chamber and said motor chamber lying side-by-side and generally in alignment with each other so as to be mutually parallel and perpendicular to said vertical end wall so as to achieve balance of weight between the front and rear of said saw, with the front-to-back center of gravity being slightly to the rear of said saw blade drive spindle;

a base for contacting the material to be cut and pivot means



comprising a pin and a round holder for vertical movement of the saw relative to the base to adjust the depth of the saw cut, said pivot means being located forward of the saw blade in relation to the advancing direction of the saw blade; and

an inverted C-shaped handle mounted above and bridging over said battery chamber and said motor chamber, said handle having an elongated top grip lying generally parallel to the cutting direction of the saw.

4,555,850

HAND PLANE, IN PARTICULAR A HAND PLANE MACHINE DESIGNED AS AN ELECTRIC HAND TOOL MACHINE

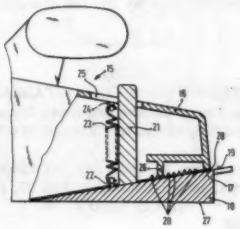
Alfred Frech, Stuttgart, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Del.X

Filed Oct. 28, 1983, Ser. No. 547,053

Claims priority, application Fed. Rep. of Germany, Jan. 12, 1983, 3300753

Int. Cl.⁴ B27G *17/02*

U.S. Cl. 30—490 **11 Claims**



1. A hand plane, comprising: a housing having an inclined forward portion as considered in direction of displacement of the hand plane; a tool element fixed to the housing; means for adjusting the planing depth, including a wedge-shaped element having an upper surface with a plurality of locking teeth arranged thereon, the wedge-shaped element being adjustably fastened to the inclined forward portion of the housing and having a base surface opposite to the upper surface constituting a contact surface of the hand plane, the adjusting means futher including a web engageable with a respective one of the locking teeth so as to allow adjustment of the planing depth; and means for fixedly fastening the wedge-shaped element to the housing.

4,555,851

X-Y TABLES PARTICULARLY FOR USE AS PLOTTERS

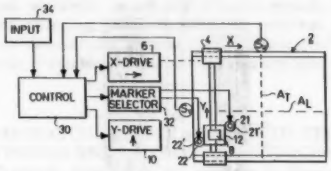
Nessim I. Levy, 13 Habrosh St., Savyon, Israel

Filed May 23, 1984, Ser. No. 613,121

Claims priority, application Israel, Jul. 8, 1983, 69183

Int. Cl.⁴ B43L *13/00*

U.S. Cl. 33—18 R **9 Claims**



1. An X-Y table comprising: a displaceable head including a holder for a working implement; and X-axis carriage for displacing said head along the X-axis of said table; and a Y-axis carriage for displacing said head along the Y-axis of said table; characterized in that said displaceable head includes at least a second holder for a second working implement, the first-mentioned holder being on one side of the displaceable head with respect to one of said axes, and the second holder being on the opposite side of the displaceable head with respect to said one axis; and in that X-Y table further includes selective enabling means sensing the position of said displaceable head and selectively enabling one or the other of said working implements to permit substantially the complete table area to be used for working purposes.

4,555,852

HAND DEVICE FOR DETERMINING VEHICLE POSITION

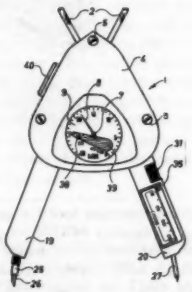
Jens Brazel, Richard-Wagner-Str. 62, 7310 Plochingen, Fed. Rep. of Germany

Filed May 3, 1983, Ser. No. 491,164

Claims priority, application Fed. Rep. of Germany, May 3, 1982, 3216322

Int. Cl.⁴ B43L *9/22*

U.S. Cl. 33—27 B **7 Claims**



1. A hand-held device for determining the momentary position on a map of a vehicle moving in approximately a straight line and at a substantially constant speed across the surface of the earth comprising

a housing;

first and second compass legs each having a point, said legs being pivotable about a pivot pin;

means defining an elongated slot fixed to said housing for receiving said pivot pin;

drive means having a drive shaft for pivotably driving said

legs about said pin without moving said legs longitudinally, said drive means including

a toothed rack;

means for guiding said rack along a line perpendicular to said slot;

a pinion engaging said rack and drivingly coupled to said drive shaft;

a drive peg attached to said rack and engaging one of said pivotable legs between said pivot pin and the point on said one pivotable leg;

a second rack engaging said pinion;

means for guiding said second rack along a line perpendicular to said slot; and

a second drive peg attached to said second rack and engaging the other leg; and

means for adjusting the position of said pivot pin along said slot and along said one pivotable leg as a function of flight speed, said means including

an elongated longitudinally adjustable member;

means fixedly attached to one end of said member and to said pivot pin;

means defining an elongated slot carried by said one pivotable leg for slidably receiving said pivot pin; and

a speed scale adjacent said member.

4,555,853

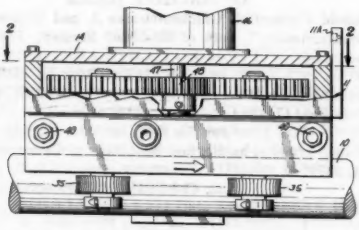
DRIVE FOR POSITION CONTROLLED LINEARLY MOVABLE CARRIAGE

John O. Lenz, Coon Rapids, Minn., assignor to Kurt Manufacturing Company, Inc., Minneapolis, Minn.

Filed Jan. 30, 1984, Ser. No. 575,033

Int. Cl.[4] G01B *3/12*

U.S. Cl. 33—125 M **13 Claims**



1. A carriage drive apparatus for positioning a carriage along a guide rail having a longitudinal axis, the carriage drive apparatus comprising:

a carriage drive housing;

first and second drive roller means rotatably mounted on the carriage drive housing in position to engage opposite sides of a guide rail, the first and second drive roller means adapted for frictional engaging contact with such guide rail;

said carriage drive housing comprising first and second sections, the first drive roller means being positioned on the first section and the second drive roller means being positioned on the second section, adjustable means for urging the first and second sections together and for thereby urging the first and second drive roller means against the opposite sides of a guide rail on which the carriage drive housing is mounted for frictional engaging contact with such guide rail;

motor means coupled to the first and second drive roller means for driving the first and second drive roller means to move the housing along a guide rail on which the carriage drive housing is mounted; and

means for sensing the position of the carriage drive housing along a guide rail.

4,555,854

ROLL TAPE MEASURE

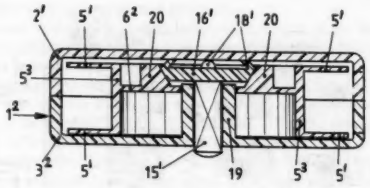
Richard Kuntze, Leichlingen, Fed. Rep. of Germany, assignor to Karl Kuntze (GmbH & Co.), Solingen, Fed. Rep. of Germany

Filed Jun. 19, 1984, Ser. No. 622,327

Claims priority, application Fed. Rep. of Germany, Jul. 1, 1983, 3323706

Int. Cl.[4] G01B *3/10*

U.S. Cl. 33—138 **5 Claims**



1. A tape measure comprising:

(a) a hollow casing comprising spaced substantially parallel first and second walls and an annular wall connecting said spaced first and second walls about their respective peripheries, said annular wall having an aperture therein;

(b) a cylindrical shaft within said casing and integral with said first wall and projecting towards but terminating a spaced distance from said second wall, a passage extending through said first wall and said cylindrical shaft;

(c) a drum rotatably mounted on said cylindrical shaft and having one side thereof spaced from the interior surface of said second wall;

(d) an elongated flexible tape secured at one end to said drum and being normally wound thereon, the opposite end of said tape passing through said aperture in said annular wall;

(e) means in said casing operatively engaged with said drum for biasing said drum in a rotary direction for winding said tape on said drum; and

(f) manually releasable means for preventing rotation of said drum in said rotary direction by said biasing means and retaining said drum in a fixed rotary position;

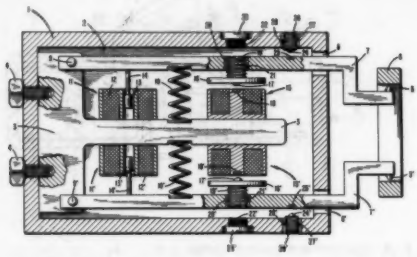
(g) said manually releasable retaining means comprising an axially displaceable member passing through and extending beyond the opposite ends of said passage in said first wall and said cylindrical shaft, one end of said axially displaceable member projecting from the exterior surface of said first wall, and a plastic brake member mounted on the end of said axially displaceable member opposite said one end thereof and extending transverse to the axis of said axially displaceable member and between said interior surface of said second wall and said one side of said drum, said brake member comprising a surface on one side thereof facing said one side of said drum for frictionally engaging said one side of said drum and a plurality of plastic elastic tongues integral with said brake member and projecting from the side of said brake member and confronting said interior surface of said second wall, said tongues impinging against said interior surface of said second wall and biasing said brake member towards said one side of said drum such that said surface on said one side of said brake member frictionally engages said one side of said drum;

(h) whereby when said tape is extended from said casing said drum is normally retained in a fixed rotary position by said brake member and upon manual depression of said axially displaceable member said plurality of elastic tongues are depressed against the interior surface of said second wall and said surface of said brake member is moved out of contact with said one side of said drum and towards said second wall so that said biasing means causes said drum to be rotated in said one direction and said tape to be retracted and wound on said drum.

4,555,855
ELECTRONIC GAUGE WITH AT LEAST ONE MOVABLE ARM AND A RETRACTION DEVICE

Guido Golinelli, Bologna, and Carlo Dall'Aglio, Volta Reno di Argelato, both of Italy, assignors to Finike Italiana Marposs S.p.A., S. Marino di Bentivoglio, Italy

Filed Aug. 22, 1983, Ser. No. 525,409
Claims priority, application Italy, Sep. 9, 1982, 3529 A/82
Int. Cl.⁴ G01B 7/12
U.S. Cl. 33—147 K **12 Claims**



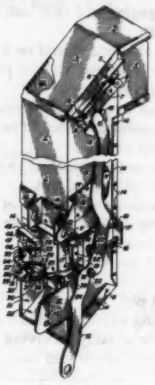
1. An electronic gauge for checking linear dimensions of mechanical pieces, more specifically during machining on a grinding machine, comprising an outer casing, support means fixed to said casing, at least a movable arm pivotally attached to said support means, a feeler coupled to the movable arm, resilient means cooperating with the movable arm for urging it in a measurement direction, a position transducer including two mutually movable elements, one of said elements being coupled to the movable arm, the position transducer providing a signal depending on the positions of the movable arm with respect to said support means, an electric retraction device for retracting the movable arm to a retracted position, said retraction device including two elements respectively coupled to said movable arm and said support means, said two elements of the retraction device including a first element consisting of an electromagnet and a second element consisting of an armature and adjustment means adapted to cooperate with said arm for setting said retracted position, and wherein said adjustment means are fixed to one of said elements of the retraction device, this element and the adjustment means being simultaneously adjustable.

4,555,856
BOW SIGHT

Dewey E. Brown, Rte. 4, Box 126, Bastrop, La. 71220

Continuation-in-part of Ser. No. 512,355, Jul. 11, 1983, Pat. No. 4,507,874. This application Jun. 18, 1984, Ser. No. 621,954
The portion of the term of this patent subsequent to Apr. 2, 2002, has been disclaimed.
Int. Cl.⁴ F41G 1/46
U.S. Cl. 33—265 **20 Claims**

1. A bow sight comprising:
(a) a housing;
(b) a first opening provided in one end of said housing and a top mirror adjustably positioned in angular relationship in said one end of said housing and facing said first opening;
(c) a second opening provided in the opposite end of said housing and facing in the opposite direction from said first opening and a bottom mirror positioned in said opposite end of said housing, said bottom mirror facing said second opening and disposed in generally parallel relationship with respect to said top mirror;
(d) a third opening provided in said housing between said first opening and said second opening, said third opening facing in the same direction as said first opening and a compensating mirror adjustably positioned in said housing and facing said third opening; and
(e) adjusting means in cooperation with said housing and said compensating mirror, whereby a first segment of a target image received by said top mirror is reflected to said bottom mirror and a corresponding segment of the target image received by said compensating mirror is

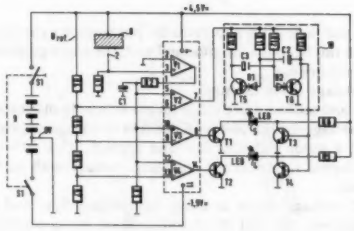


simultaneously and independently reflected to said bottom mirror for comparison of the first segment and the corresponding segment of the target image and calibration of an arrow trajectory by manipulation of said adjusting means.

4,555,857
METHOD AND DEVICE FOR THE ACCURATE SETTING OF MACHINE TOOLS

Reinhold Christoffel, Glückaufstrasse 3, and Heiner Wesoly, Schillerstrasse 7, both of D - 3203 Sarstedt, Fed. Rep. of Germany

PCT No. PCT/DE82/00153, § 371 Date Mar. 24, 1983, § 102(e) Date Mar. 24, 1983, PCT Pub. No. WO83/00551, PCT Pub. Date Feb. 17, 1983
PCT Filed Jul. 22, 1982, Ser. No. 483,953
Claims priority, application Fed. Rep. of Germany, Jul. 28, 1981, 3129590
Int. Cl.⁴ G01B 7/28
U.S. Cl. 33—561 **4 Claims**



1. An arrangement for facilitating precise adjustment of the relative position of a stationary workpiece edge and the axis of a rotating member in a machine, comprising a sensing head arranged to be connected to and to rotate with the member of the machine, said head having a cylindrical work-contacting sensor, a housing, a source of electrical energy in said housing and a shaft having a first portion connected with one pole of said energy source and a second portion connectable with the member of the machine for rotation therewith, said sensor being provided on said shaft and said sensing head further comprising means for monitoring the duration of contact be-

tween said sensor and the edge of the workpiece per revolution of said head in response to movement of said head relative to the workpiece, said head and the member of the machine assuming an acceptable adjusted position relative to the edge of the workpiece when the duration of contact during each revolution of the head corresponds to that denoting that the contact takes place while the head turns through an angle of between 180 and 300 degrees, said monitoring means including optical indicating means of said duration of contact and said indicating means including light emitting diodes, said monitoring means further including switching means for said indicating means and said switching means comprising a plurality of amplifiers each arranged to react to a predetermined reference potential, said amplifiers including a first amplifier having an input and an output and said sensor being connected with the input of said first amplifier and having a free end electrically insulated from said shaft, said amplifiers constituting the comparators of an integrated circuit for a common operating voltage, the input of said first amplifier being a positive input and the other amplifiers having negative inputs arranged to receive different reference voltages and positive inputs arranged to receive d-c voltage impulses from the output of said first amplifier in dependency on the duration of contact between said sensor and the edge of the workpiece per revolution of said head, said diodes including a first and a second diode and said amplifiers further including second and third amplifiers having outputs each connected with a different one of said first and second diodes, said amplifiers further including a fourth amplifier having an output and said switching means further including a multivibrator circuit connected with the output of said fourth amplifier, said multivibrator circuit being arranged to periodically switch off said first and second diodes in dependency on said d-c voltage pulses, said switching means further comprising transistor means connected between said multivibrator circuit and said first and second diodes.

4,555,858

METHOD AND DEVICE FOR LOW ENERGY CONSUMPTION OR GRANULAR PRODUCTS OR THE LIKE CONTAINING MOISTURE FIXED OR DEPOSITED AT THE SURFACE WITH A CONSTANT YIELD

Béla Hegedus; Sándor Bálint, both of Orosháza; János Hudák, Nagyszénás; György Barta, and József Aszlányi, both of Budapest, all of Hungary, assignors to "Oktober 6" Mezogazdasagi Termeloszovetkezet, Hungary

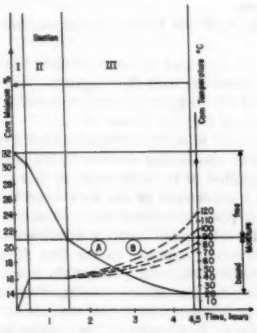
PCT No. PCT/HU82/00053, § 371 Date Jun. 14, 1983, § 102(e) Date Jun. 14, 1983, PCT Pub. No. WO83/01502, PCT Pub. Date Apr. 28, 1983

PCT Filed Oct. 18, 1982, Ser. No. 513,116

Claims priority, application Hungary, Oct. 21, 1981, 3071/81

Int. Cl.[4] F26B *21/10*

U.S. Cl. 34—25 **11 Claims**



1. A process for drying agricultural and other granular products or produces having a surface and bound moisture content, comprising the steps of:

(a) introducing said product into a drying area that is subdivided into sections of preheating and intensive drying, a section for the removal of bound moisture from said product, and a cooling section;

(b) bringing a heated drying agent into contact with said product in the section for the removal of bound moisture from said product;

(c) directing the drying agent from the section for the removal of bound moisture to the sections for preheating and intensive drying of said product;

(d) venting the drying agent, laden with vapor from the drying operation, from the drying area for further utilization or into the open air;

(e) measuring both the moisture content of the product to be dried and fed into the drying area, and that of the product leaving the cooling section of the drying area, and obtaining a differential-analog signal therefrom; and

(f) controlling the flow rate of the product to be dried and the temperature of the drying agent, individually or simultaneously, in response to said differential-analog signal.

4,555,859

VIEWER FOR READING AND/OR DISPLAYING INFORMATION RECORDED ON WRITTEN OR PRINTED TAPE

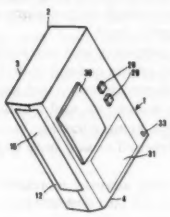
Fausto Corso, Via Galvani 2, Sommacampagna, Italy

Filed Aug. 1, 1983, Ser. No. 518,888

Claims priority, application Italy, Aug. 6, 1982, 84953 A/82

Int. Cl.[4] G09F *27/00*

U.S. Cl. 40—457 **10 Claims**



1. A viewer for reading and/or displaying information recorded on written or printed tape, comprising:

a housing having an opening;

a magnifying lens in said opening;

two spaced apart reels arranged in said housing at two opposed sides of said opening;

a tape having marks thereof for winding around said reels;

a pair of motor means connected to said reels;

a first forward push bottom and a second rewind push botton for selectively actuating said motor means;

a main switch;

a control circuit in said housing for controlling the actuation of said motor means, said control circuit having a forward section and a rewind section, each said section comprising memory means having two inputs and at least one output, a first input of said memory means being connected with either said push-botton, said memory means feeding at said first output thereof a first electric signal of a first logical level upon actuation of said memory means by said push-botton. drive means connected to said first output for feeding said motor means upon reception of said first signal from said memory means, said control circuit further comprising reader means arranged in said housing on the path of said tape between said two reels for detecting said marks, said reader means having an output connected to a second input of said memory means of each said section and generating a second electric signal upon detec-

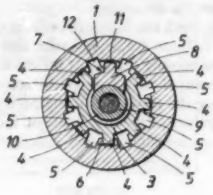
tion of said marks on said tape and causing said first electric signal at said output of said memory means to switch from said first logical level to a second logical level for switching off and stopping said motor means.

4,555,860

RIFLE BREECH ASSEMBLY

Ulrich Zedrosser, Steyr, Austria, assignor to Steyr-Daimler-Puch Aktiengesellschaft, Vienna, Austria

Filed Dec. 20, 1982, Ser. No. 451,042
Claims priority, application Austria, Mar. 24, 1982, 1143-82
Int. Cl.⁴ F41C *15/00*
U.S. Cl. 42—25 **1 Claim**



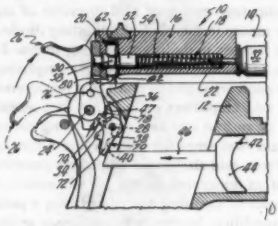
1. In a rifle breech assembly comprising
a housing having open forward and rear ends and an inside peripheral surface extending from said forward end to said rear end and formed adjacent to said forward end with a forwardly and inwardly open annular bore, said inside peripheral surface defining a plurality of angularly spaced apart grooves which extend along said housing and open into said angular bore,
a breechblock extending into said housing from said rear end and provided on the outside at its forward end with locking bosses adapted to enter said grooves and slide therein to guide the bosses into said annular bore,
said breechblock being rotatable in said housing when said bosses are disposed in said bore so as to lock said breechblock,
said housing being adapted to receive at its forward end a barrel so that the latter constitutes a forward side face of said annular bore,
an extractor without a locking boss carried by said breechblock and extending between two of said locking bosses, the extractor having a free end provided with an extractor hook and being pivoted to said breechblock so that said extractor hook is movable radially inwardly and outwardly, and
spring means biasing said extractor so as to urge said extractor hook radially inwardly,
the improvement comprising that
said extractor hook extends into said annular bore and is peripherally movable therein when said locking bosses are disposed in said annular bore,
said inside peripheral surface comprises a peripherally and longitudinally extending supporting surface defining said annular bore,
said inside peripheral surface defines a radially extending recess radially inwardly open to said annular bore and angularly spaced from and adjoining said supporting surface to receive said extractor hook, and
said breechblock with said locking bosses and said extractor hook extending in said annular bore is rotatable in said housing to a locking position in which said supporting surface radially registers with said extractor hook to prevent a radially outwardly directed movement thereof, and to an unlocked position in which said extractor hook radially registers with said radially extending recess and enters the same by a pivotal movement of said extractor and said locking bosses align with said grooves to permit sliding of said breechblock in said housing.

4,555,861

FIRING PIN LOCKING DEVICE

Donald S. Khoury, Granby, Mass., assignor to Colt Industries Operating Corp, West Hartford, Conn.

Filed Dec. 16, 1983, Ser. No. 562,086
Int. Cl.⁴ F41C *19/00, 17/04*
U.S. Cl. 42—70 F **5 Claims**



1. In an improved firearm of the type comprising:
a frame having a hammer pin and a sear pin;
a breech-slide mounted on the frame for sliding movement between forward and rearward positions;
a firing pin mounted in the breech-slide for travel between firing and retracted positions;
a hammer, having a searing surface thereupon, mounted on the frame upon the hammer pin for pivoting movement between cocked and fired positions, the hammer being adapted to strike the firing pin as it moves into the fired position for causing the pin to engage a chambered cartridge and being adapted to be cocked by the breech-slide as it moves rearwardly;
a trigger assembly, having a trigger and a trigger bar integral therewith, mounted on the frame for axial sliding movement between normal and pulled positions;
a sear pivotally mounted on the frame upon the sear pin for engaging the searing surface of the hammer such that it may be retained in the cocked position, the rearward movement of the bar serving to displace the sear to occasion disengagement with the searing surface of the hammer, whereby the hammer may fall to the fired position; and wherein the improvement comprises:
a firing pin lock, having an abutment surface thereupon, slideably mounted on the breech-slide for sliding movement between an upper movement permitting position in which travel of the firing pin from the retracted position to the firing position is unimpeded and a lower movement preventing position in which the abutment surface is adapted to engage and obstruct the firing pin during travel toward the firing position;
means to bias the lock toward the movement preventing position;
means to retain the lock in the movement preventing position;
a first lever mounted for rotation upon the sear pin in operative connection with the trigger bar such that axial movement of the trigger assembly produces a corresponding rotation of the first lever;
a second lever mounted for rotation upon the hammer pin in operative connection with the lock and the first lever such that rotation of the second lever in a first direction produces a movement of the lock from the movement preventing position toward the movement permitting position and subsequent rotation of the second lever in a second direction opposite to the first direction produces a movement of the lock toward the movement preventing position, the second lever being in operative connection with the first lever such that rotation of the first lever in response to movement of the trigger assembly from the normal position to the pulled position produces a rotation of the second lever in the first direction which results in

movement of the lock from the movement preventing position to the movement permitting position.

5. In an improved firearm of the type comprising:

a frame;

a breech-slide mounted on the frame for sliding movement between forward and rearward positions;

a firing pin mounted in the breech-slide for travel between firing and retracted positions;

a hammer, having a searing surface thereupon, mounted on the frame for movement between cocked and fired positions, the hammer being adapted to strike the firing pin as it moves into the fired position for causing the pin to engage a chambered cartridge and being adapted to be cocked by the breech-slide as it moves rearwardly;

a sear movably mounted on the frame for engaging the searing surface of the hammer such that it may be retained in the cocked position, displacement of the sear occasioning disengagement with the searing surface of the hammer, whereby the hammer may fall to the fired position; and wherein the improvement comprises:

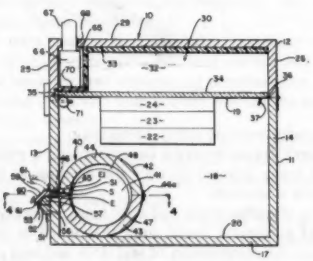
the hammer having a shelf-like flat surface on its lower periphery for engaging the sear such that the hammer may be retained in the event of a searing surface fall off, the flat surface being disposed on the hammer at a location where the hammer will undergo only a small rotational movement to the fired position upon disengagement of the sear and the flat surface whereby the firing pin will not engage and fire a cartridge.

4,555,862

TACKLE BOX

Raymond Panasewich, 150 Glacier Ct., Oregon City, Oreg. 97045

Filed Dec. 22, 1983, Ser. No. 564,207
Int. Cl.[4] A01K *97/00*
U.S. Cl. 43—54.1 **19 Claims**



14. A fishing tackle box, comprising:

(a) a compartment in which fishing tackle is stored, the compartment having a sidewall which has a plurality of aligned openings therein;

(b) means within the compartment adjacent the sidewall, for holding a plurality of spools of fishing line in side-by-side parallel relation where the spools are free to rotate about their respective axes, the means holding the spools such that fishing line can pass from a spool exteriorly of the tackle box through an adjacent opening in the sidewall;

(c) means disposed on the sidewall exteriorly of the tackle box and compartment therein adjacent each of the openings in the sidewall, for cutting fishing line exteriorly of the tackle box;

(d) means for at least partially covering the cutting means to protect it and help prevent anyone from accidently cutting themselves on the cutting means; and

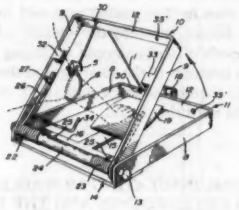
(e) means mounting the covering means (d) on the sidewall exteriorly of the tackle box for movement into and out of at least partial covering relation with the cutting means.

4,555,863

SNARE TRAP

Ivan Bouffard, Chemin du lac de l'ESt, Coleraine, Quebec, Canada (G0N 1B0)

Filed Jan. 3, 1984, Ser. No. 567,631
Int. Cl.[4] A01M *23/34*
U.S. Cl. 43—87 **3 Claims**



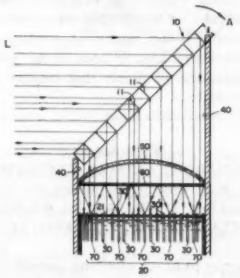
1. A snare trap comprising a noose and means for tightening said noose, such means consisting of an outer frame, a spring-actuated inner frame pivotally secured to said outer frame and adapted to pivot about an axis normal to its longitudinal extent from a first set position where said inner frame lies within said outer frame to a second sprung position after a rotation of substantially 180° , latch means for releasably retaining the swinging end of said inner frame in its first position, trigger means by which an animal can release said latch means, said noose, when set, removably secured to said outer frame and surrounding said trigger means when said inner frame is in set position and adapted to be drawn upon the leg of an entrapped animal when the trap is sprung, said outer frame comprising a base section supporting said latch means and said trigger means, a wall section secured to said base section, extending in a transverse plane relative to the plane of said base section to surround said inner frame when in its first position, and a short rod secured to said outer frame at a distance from said axis and detachably engaging a first part of said noose and releasing said first part when the trap is sprung.

4,555,864

CHLORELLA NURTURING DEVICE

Kei Mori, 3-16-3-501, Kaminoge, Setagaya-ku, Tokyo, Japan

Filed Jun. 14, 1984, Ser. No. 620,406
Claims priority, application Japan, Jun. 24, 1983, 58-114768
Int. Cl.[4] A01G *7/00*
U.S. Cl. 47—1.4 **8 Claims**



1. A chlorella nurturing device comprising a chlorella nurturing tank containing a chlorella nurturing liquid, optical conductor means disposed within said tank, said optical conductor means comprising a plurality of elongated optical conductor members extending into said liquid and having upper end portions extending above the upper surface of said liquid,

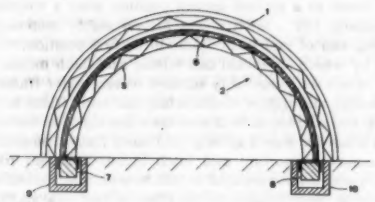
reflection mirror means disposed over said tank for reflecting solar rays generally downwardly into said tank, a plurality of lenses disposed between said reflector means and said optical conductor means, each of said conductor members having a light-receiving edge on said upper end portion thereof, said conductor members being disposed so that said light-receiving edges are positioned at the focus of each of said lenses such that solar rays focused by said lenses are guided into said conductor members and thus further guided into said liquid below the upper surface thereof, whereby the intensity of the solar light at the upper levels of said chlorella nurturing liquid is weakened while the intensity of the solar light at the lower levels is strengthened to thereby enhance uniformity of light intensity in said chlorella nurturing liquid.

4,555,865

RIGID THERMOINSULATING MOVABLE COVERING FOR GREENHOUSES AND THE LIKE

Francesco V. di Monteforte, 184 Via Vittorio Emanuele, 95029 Viagrande (Catania), Italy

Filed Jul. 7, 1982, Ser. No. 396,135
Claims priority, application Italy, Jul. 7, 1981, 35902/81[U]
Int. Cl.⁴ A01G *9/24, 9/22*
U.S. Cl. 47—17 **9 Claims**



1. A movable rigid thermoinsulating covering for preventing the dispersion of heat from the interior to the exterior of a greenhouse associated with parallel channels along the length of the greenhouse comprising a monobloc rigid self-supporting structure provided with a single layer of polystyrene foam thermoinsulating material, the structure including a ceiling zone and a plurality of springer surfaces, the structure also being provided with a sliding means including a plurality of floats integral with the springer surfaces, the floats being immersed in water contained in the parallel channels, the channels being positioned, configured and dimensioned along the length of the greenhouse so that the structure can be moved from an inoperative to an operative position, wherein the inoperative position provides an area of the greenhouse suitable for the cultivation of plants that require minimal light conditions for growth.

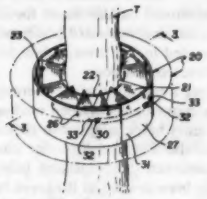
4,555,866

CLIMBING ANIMAL BARRIER

Emory B. Stone, P.O. Box 121, Whigham, Ga. 31797

Filed Sep. 7, 1984, Ser. No. 648,042
Int. Cl.⁴ B32B *3/02, 3/28;* **A01G** *13/10*
U.S. Cl. 47—23 **12 Claims**

1. A metal barrier to block climbing animals comprising an accordion pleated generally horizontal foraminous barrier wall, flexible means to attach the inner longitudinal margin of the foraminous barrier wall in abutment with a substantially vertical support surface on which the metal barrier is installed, a substantially imperforate barrier sheet adjacent to the outer longitudinal margin of the foraminous barrier wall and being substantially coextensive lengthwise therewith, means connecting the foraminous barrier wall and said imperforate barrier sheet in assembled relationship, and means on the metal barrier allowing expansion thereof, at least said foraminous



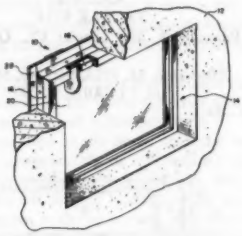
barrier wall extending substantially horizontally away from said support surface on which the barrier is installed.

4,555,867

SECURITY WINDOW COVER

Paul E. Stibolt, 22507 Ridgeway Ave., Richton Park, Ill. 60471

Filed Mar. 13, 1984, Ser. No. 589,136
Int. Cl.⁴ E05B *65/04*
U.S. Cl. 49—67 **10 Claims**



1. A security window cover comprising:

a peripheral frame structure circumscribing a window, said frame being adapted to abut the opening in which the window is secured;

a security shielding door, said door being hingedly attached to said peripheral frame such that when in the closed position the combination of said door and said peripheral frame member completely covers said opening, said shielding door including a rdige located medial and substantially parallel to the edges of said door, said ridge serving to strengthen said door, act as a guide and support for insulating material which may be added to the outside of said door for energy conservation and provide protection for said frame from tampering from outside said window;

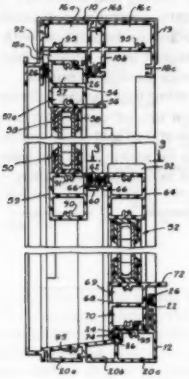
locking means on the inside of said security window door for securing said shielding door to said frame when said door is in the closed position;

the shape of said peripheral frame structure and said frame being substantially that of a parallelogram and having at least one first wall for conforming to the interior building wall adjacent said window and at least four second walls for conforming to the inside circumference of said window, said second walls having partial rigid joints securing said four walls to one another at the corners of said parallelogram along only a portion of the end dimension of each said second wall to allow for a final adjustment in fit when being installed over a window.

4,555,868
VINYL TILT WINDOW ASSEMBLY

Paul Mancuso, Mamaroneck, N.Y., assignor to Fiberlux, Inc., Richmond, Va.

Filed Oct. 3, 1983, Ser. No. 538,577
Int. Cl.[4] E05D 15/22
U.S. Cl. 49—181 8 Claims



1. A tilt window frame comprising a header, a sill, and a pair of jambs, each made of rigid plastic;

wherein said header and said sill each comprise, in cross-section, a base portion, formed by at least one hollow, and sections integral therewith and depending therefrom for engaging a sash member; and

wherein each jamb is a rigid plastic, one-piece extrusion comprising, in cross-section, a base portion and an outer leg, an inner leg, and a center leg therebetween, said legs projecting from said base portion toward the interior of said frame, wherein:

said base portion is formed by a plurality of integral hollows including a hollow parting strip and a spacer hollow;

said inner leg is formed by at least one hollow integral with a hollow of said base portion;

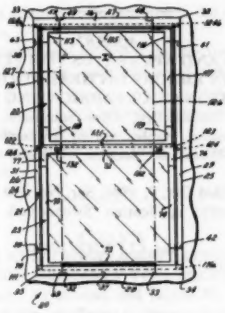
said center leg projects from said hollow parting strip and has a first portion formed by at least one hollow integral with said hollow parting strip and integral with said spacer hollow, the aforesaid first portion also being generally co-extensive with said inner leg to define, with said inner leg, an inner channel, and said center leg including a second portion formed by at least one hollow integral with a hollow of said first portion and projecting a distance further than said inner leg to define a first sash engagement panel; and

said outer leg has a first portion formed by at least one hollow projecting from and integral with said spacer hollow, the first portion of said outer leg being generally co-extensive with the second portion of said center leg to define, with said center leg, an outer channel spaced toward the interior of said frame relative to said inner channel; and said outer leg including a second portion formed by at least one hollow integral with a hollow of the first portion of said outer leg and projecting therefrom a distance further than said center leg to define a second sash engagement panel, said inner and outer channels being arranged to guide slideable sash support members whereby each panel forms a rigid surface, engageable with a sash member, to provide effective weather sealing.

4,555,869
REPLACEMENT WINDOWS WITH PREFORMED CORNERS

Albert Kenkel, 3112 Lawrence Dr., Edgewood, Ky. 41017

Filed Feb. 29, 1984, Ser. No. 584,778
Int. Cl.[4] E05D 13/04
U.S. Cl. 49—449 9 Claims

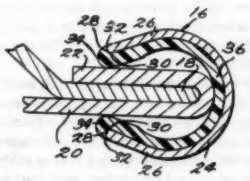


1. A window sash comprising first and second opposed vertical side members, a top horizontal member and an opposed bottom horizontal member, first, second, third, and fourth preformed corners connecting said side members and said top and bottom members to form a rectangular frame, said sash further including at least one latch mechanism extending from said first corner, and said latch mechanism held only by said first corner.

4,555,870
DOOR EDGE GUARD TRIM

Greg E. J. McKinnon, Barrie, and Arthur J. Hoke, Brampton, both of Canada, assignors to Magna International, Inc., Ontario, Canada

Filed Aug. 22, 1983, Ser. No. 525,472
Int. Cl.[4] B60J 5/00
U.S. Cl. 49—462 19 Claims



1. An edge guard for an automobile door edge or the like comprising

a sheet metal strip roll formed into a generally U-shaped cross-sectional configuration so as to provide a bight portion and a pair of leg portions extending therefrom terminating in free ends,

one of said pair of leg portions constituting an exterior leg portion for guarding the exterior of the door edge,

said exterior leg portion being of uniform one ply thickness,

the free end of said exterior leg portion being defined by the edge of the one ply thickness of said exterior leg portion and

an extrudable thermoplastic insulating material extruded in covering relation to the interior surfaces of said leg portions in sufficient quantity to enable the metal strip to be installed on a door edge in scratch free fashion and in covering relation to the interior surface of the bight por-

tion in sufficient quantity to provide a desired insulation between the metal strip and the door edge during use,

said extrudable thermoplastic insulating material being extruded in covering relation to the free end of said exterior leg portion,

the exterior surfaces of said exterior leg portion and said bight portion being smooth and free of insulating material so as to present an exposed metallic visual appearance.

4,555,871

METHOD AND APPARATUS FOR ELIMINATING UNDULATION ERRORS ON GEAR-TOOTH FLANKS IN PRODUCTION GEAR-FABRICATING MACHINES

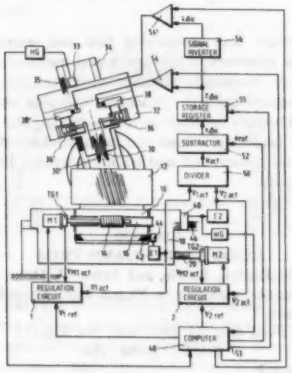
Peter Bloch, Mutschellen; Otto Schneider, Gränichen, and Meinrad Donner, Nuolen, all of Switzerland, assignors to Maag Gear-Wheel & Machine Company Limited, Zurich, Switzerland

Filed Oct. 9, 1984, Ser. No. 659,182

Claims priority, application Switzerland, Oct. 18, 1983, 5659/83

Int. Cl.⁴ B24B *1/00*

U.S. Cl. 51—52 R **8 Claims**



6. An apparatus for eliminating undulation errors on gear-tooth flanks when fabricating gears in a production gear-fabricating machine having a rotary table for the gear to be fabricated, comprising:

a first drive mechanism associated with said rotary table for rotating said rotary table at a predetermined angular velocity together with said gear to be fabricated and a second drive mechanism associated with said rotary table for simultaneously translating said rotary table at a predetermined linear velocity together with said gear to be fabricated for inducing a generating motion corresponding to a desired involute profile between at least one gear-fabricating tool and at least one gear-tooth flank;

measurement devices associated with said rotary table for monitoring said angular and linear velocities;

a computer for determining a reference drive ratio between a reference angular velocity and a reference linear velocity for said rotary table;

a generating roll position transducer for determining a momentary generating roll position of said gear to be fabricated;

a stroke position transducer for determining a momentary stroke position of said at least one gear-fabricating tool;

a first measuring device for measuring momentary angular velocities of said rotary table;

a second measuring device for measuring momentary linear velocities of said rotary table;

a divider device for determining momentary drive ratios between said momentary angular velocities measured by said first measuring device and said momentary linear velocities measured by said second measuring device;

a subtractor device for forming difference values between said reference drive ratio and said momentary drive ratios;

said subtractor device having an output;

said computer having a generating roll and stroke output;

a storage device connected to said output of said subtractor device and to said generating roll and stroke output of said computer for storing said difference values in association with momentary generating roll positions of said gear to be fabricated and in association with momentary stroke positions of said at least one gear-fabricating tool;

said storage device having an output;

said gear-fabricating tool having a servo-valve; and

a first correction device connected to said output of said storage device and to said servo-valve for correcting feed motion values for said at least one gear-fabricating tool by the amount of said difference values.

4,555,872

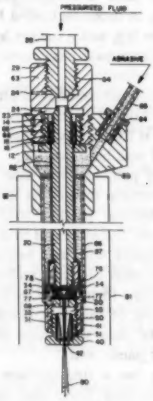
HIGH VELOCITY PARTICULATE CONTAINING FLUID JET PROCESS

Gene G. Yie, Auburn, Wash., assignor to Fluidyne Corporation, Auburn, Wash.

Division of Ser. No. 387,437, Jun. 11, 1982, Pat. No. 4,478,368. This application Jan. 24, 1984, Ser. No. 573,496

Int. Cl.⁴ B24C *5/04*

U.S. Cl. 51—439 **32 Claims**



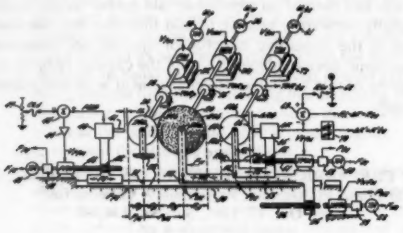
1. A process for producing a fluid jet stream having a pressure greater than 10,000 psi comprising solid particulates, said process comprising: forming a foam comprising said solid particulates, forming at least one fluid jet stream of sufficient velocity to produce said pressure, mixing said foam comprising said solid particulates with said fluid jet stream, and passing said mixed solid particulate-fluid jet stream through a converging flow shaping nozzle, the throat of said flow shaping nozzle confining the output of said mixed solid particulate-fluid jet stream.

4,555,873

METHOD AND APPARATUS FOR WHEEL CONDITIONING IN A GRINDING MACHINE

Roderick L. Smith, Rockford, Ill., assignor to Energy-Adaptive Grinding, Inc., Rockford, Ill.

Division of Ser. No. 249,192, Mar. 30, 1981, abandoned. This application Feb. 15, 1984, Ser. No. 580,187
Int. Cl.[4] B24B *53/00*
U.S. Cl. 51—165.87 34 Claims



29. In a grinding machine having means to support a workpiece and means for creating relative rubbing and relative infeeding of a rotationally driven grinding wheel and the workpiece to produce grinding action, a control system for maintaining the shape and/or degree of sharpness of the wheel while the grinding action is taking place, said system comprising in combination

(a) means for supporting a truing element to move bodily relative to said wheel,

(b) means for causing relative positioning and movement of said wheel and element to keep the operative surface of the element spaced by a predetermined gap from the face of said wheel during first time intervals while said grinding action is taking place, and

(c) means for causing relative positioning and movement of said wheel and element to create relative rubbing and relative infeeding of said face and said operative surface during second time intervals while said grinding action is taking place,

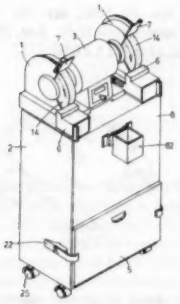
said first and second intervals being alternately interspersed in time.

4,555,874

DUST COLLECTOR FOR GRINDER

Jen Y. Chung, 70, Alley 8 Ta Feng, Lane Fu Shang, Shui Nan Taichung, Taiwan

Filed Nov. 17, 1983, Ser. No. 552,770
Int. Cl.[4] B24B *55/06*
U.S. Cl. 51—270 2 Claims



1. A dust collector for a grinder, comprising:

a dust bin having wall means for defining two vertical passages located respectively at opposite sides of and within the dust bin, a first space located between said two vertical passages, a second space formed below said first space and in communication with said first space and said vertical passages, and a plurality of holes formed in a top wall of the dust bin and in communication with said first space;

a filter box adapted to be received in the first space of said dust bin;

a dust chamber adapted to be received in the second space of said dust bin;

two hoods respectively mounted on the two vertical passages of said dust bin, each said hood being composed of two parts;

two blocking frames each adjustably mounted on a lower part of one of said hoods; and

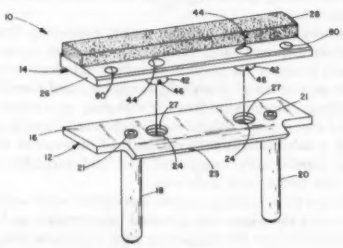
two shields each adjustably mounted on an upper part of one of said hoods.

4,555,875

MEANS FOR ATTACHING A REPLACEABLE STONE AND/OR GUIDE ASSEMBLY TO A MASTER HOLDER

Robert M. Sunnen, Frontenac, and Duane W. Woltjen, Manchester, both of Mo., assignors to Sunnen Products Company, St. Louis, Mo.

Continuation of Ser. No. 497,067, May 23, 1983, abandoned. This application Mar. 18, 1985, Ser. No. 712,927
The portion of the term of this patent subsequent to Mar. 19, 2002, has been disclaimed.
Int. Cl.[4] B24B *33/08*
U.S. Cl. 51—331 29 Claims



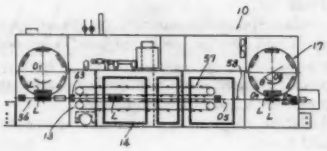
1. In a honing device, means for attaching a support member to a backing member comprising a support member having opposed surfaces and at least one round opening located extending therethrough, a backing member mounting at least one work contacting element having at least one round portion projecting therefrom formed integral with the backing member which mates with and is insertable into the round opening in said support member, the number of projecting portions on said backing member corresponding in number and location to the number and location of openings extending through said support member, each of said projecting portions having an opening extending therethrough at least a portion of which has an irregular and non-round cross-sectional shape defined by sidewall portions that extend radially outwardly different distances from the center thereof, said irregularly shaped portions being located in the area of said openings that extend through the openings in said support member, and means substantially corresponding in cross-sectional shape to the cross-sectional shape of the non-round portion of the openings through the projecting portions insertable respectively into each of said projecting portions and means for turning the means insertable to radially outwardly expand and permanently deform the irregularly shaped portion of the projecting portion into intimate engagement with the corresponding opening in said support member.

4,555,876

PROCESS AND APPARATUS FOR FINISHING ELECTRONIC DEVICE

Matsuo Ohtake, Numazu, Japan, assignor to Fuji Seiki Machine Works, Ltd., Sunto, Japan

Filed May 6, 1983, Ser. No. 492,299
Claims priority, application Japan, Mar. 13, 1982, 57-038874
Int. Cl.⁴ B24C *3/08*; B65G *57/30*
U.S. Cl. 51—418 **2 Claims**



1. A machine for finishing electronic devices, such as lead frames for integrated circuit chips, comprising:

supply means for said electronic devices including a substantially horizontal turntable rotatable about a substantially vertical axis, and a plurality of upright cassettes mounted on said turntable adjacent the periphery thereof, said cassettes being disposed in uniformly angularly spaced relationship on said turntable relative to said axis, each of said cassettes defining a vertically oriented chamber adapted to support therein a plurality of electronic devices disposed in vertically stacked relationship, the chamber having an elongated rectangular cross-section corresponding to the size of the electronic devices, the chamber having its elongate dimension extending generally in the peripheral direction of the turntable;

horizontally elongated transfer means extending from a first location disposed tangentially adjacent said turntable to a second location for permitting individual electronic devices to be moved away from said turntable, said transfer means including conveyor means for effecting movement of individual electronic devices in an elongated direction thereof along a substantially straight path of movement which extends substantially tangentially of said turntable between said first and second locations;

abrasive-particle blasting means associated with said transfer means at a third location disposed intermediate said first and second locations for subjecting said electronic devices to a blasting media, said blasting means including a housing defining therein a blasting chamber, and gun means within said chamber for directing a fluid-abrasive particle stream against said electronic devices;

said conveyor means including an elongate endless main conveyor which extends horizontally through the blasting chamber for individually transporting the electronic devices therethrough, said main conveyor including a pair of endless conveyor elements having inner reaches which are disposed in generally parallel but sidewardly spaced relationship for individually horizontally supporting said electronic devices therebetween, said endless conveyor elements having means thereon for supportingly engaging solely opposite longitudinally extending edges of the electronic devices so that upper and lower surfaces of the electronic devices are exposed as they travel through the blasting chamber; and

a transfer mechanism associated with said first location for individually and sequentially removing a lowermost electronic device from the cassette as disposed at a dispensing position adjacent said first location by moving said lowermost electronic device radially outwardly of said turntable along a direction which generally parallels a shorter width dimension of the electronic device until the device is deposited onto the upstream end of said transfer means at said first location;

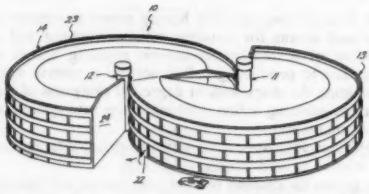
said transfer mechanism including a plurality of ejector units movably mounted on said turntable, one of said ejector units being associated with each of said cassettes, said transfer mechanism also including drive means drivingly coupled to solely the ejector unit disposed in said dispensing position for actuating same to cause sequential discharge of the electronic devices from said cassette as disposed in said first location, said ejector unit including a pusher member slidably supported on said turntable for reciprocal displacement radially thereof, said pusher member being disposed closely adjacent and radially inwardly from the respective said cassette, said cassette having guide slot means adjacent the lower end thereof for permitting said pusher means to slide radially outwardly relative to said turntable into the lower end of the respective cassette for ejecting the lowermost electronic device sidewardly from the cassette radially outwardly of said turntable into engagement with said transfer means.

4,555,877

PREFABRICATED MULTI-STORY BUILDING

Fausto Libra, Via Gustavo Vaglasindi 9, Catania, Italy

Filed Oct. 13, 1982, Ser. No. 434,045
Int. Cl.⁴ E01F *9/00*
U.S. Cl. 52—79.4 **6 Claims**



1. A prefabricated, multi-story building, comprising first and second columns adapted to be mounted in laterally spaced-apart, upright positions, first and second arcuate walls adapted to be mounted in upright positions coaxially of the first and second columns, respectively, a plurality of identical beams, means on the first column and second wall for supporting an end of each beam of first and second groups of beams, and means on the second column and first wall for supporting the opposite ends of each beam of the first and second groups of beams, said first group forming a first sector-shaped floor and said second group of beams forming a second sector-shaped floor having an end adjacent an end of the first floor which provides a ramp to permit access between them.

4,555,878

STRUCTURAL ELEMENT FOR CONSTRUCTIONS

Mario Tringali, Forte Dei Marmi, Italy, assignor to Coten S.r.l., Milan, Italy

Filed Apr. 14, 1982, Ser. No. 368,176
Claims priority, application Italy, Apr. 30, 1981, 21465 A/81
Int. Cl.⁴ E04B *1/32*
U.S. Cl. 52—81 **12 Claims**

1. A three dimensional structure comprising a plurality of like structural elements connected to one another to make up said structure, wherein each element comprises:

a central planar region shaped as one of a hexagon or a

triangle the perimeter of the region being defined by the structural elements and the region being covered by a covering element;

three planar triangular shaped, extensions from said central planar region, similarly shaped and spaced from each other on said central planar region by equal distances, the perimeter of each extension defining an area enclosed by the structural elements and covered by the covering elements; said extensions being shaped as isosceles triangles, each having a vertex remote from the central planar region and a base connected to a respective side of the central planar region, each extension being rotated from a plane defined by said central region about the base thereof through an equal angle, said triangular shaped extensions being located such that a bisecting line extending from the the vertices of the extensions extend to meet at a common point at the center of said central planar region;

and wherein the structure comprises:

a plurality of said central planar regions and a plurality of said triangular extensions with all of said triangular extensions being rotated in the same direction away from the plane defined by said central planar regions and with the vertices of the triangular extensions touching the surface of an imaginary sphere;

tie elements interconnecting the vertices of said extensions of each element for creating and maintaining in the respective elements internal stresses providing said elements with a predetermined shape and mechanical resistance, whereby by means of the tie elements structural elements are held in a three dimensional shape; and

means for connecting said elements to each other, only at the vertices thereof in configuring said structure.

4,555,879

CLADDING SYSTEMS

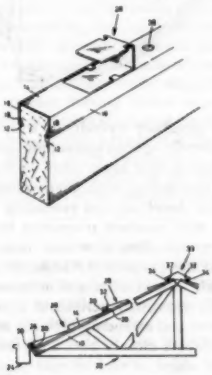
Maurice J. Cheater, Edenvale, South Africa

Filed Sep. 20, 1984, Ser. No. 652,080

Claims priority, application South Africa, Dec. 12, 1983, 83/9228

Int. Cl.[4] E04B *7/02*

U.S. Cl. 52—90 **6 Claims**



1. A support member for use in supporting cladding sheets in a cladding system and comprising a length of timber and an elongate metallic rail which has basically a U-shape in cross-section, which carries a series of spaced cleats deformable to engage the cladding sheets and hold them to the support member, and which extends lengthwise along the length of timber with continuous, inwardly directed lips at the free ends of its flanges locating snugly in continuous, longitudinally extending grooves formed on opposite sides of the length of timber so that the rail is connected intimately to the timber over its full length, the rail serving in use both for engagement of the cladding sheets and as reinforcement for the timber.

4,555,880

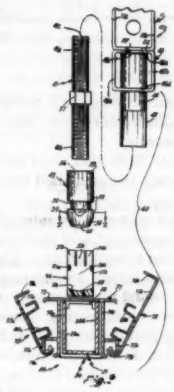
ADJUSTABLE BASE FOR OFFICE LANDSCAPING SYSTEM

Larry P. Gzym, Rockford; Lloyd G. Ritzema, Lowell, and David K. Haadsma, Jr., Wyoming, all of Mich., assignors to Stow & Davis Furniture Company, Grand Rapids, Mich.

Continuation-in-part of Ser. No. 358,091, Mar. 15, 1982, Pat. No. 4,449,337. This application Sep. 28, 1982, Ser. No. 425,502

Int. Cl.[4] E04B *2/82*

U.S. Cl. 52—126.4 **10 Claims**



1. A wall panel base construction comprising:

means for supporting a wall panel;

foot means for supporting said base construction on a surface;

a block member defining a threaded bore;

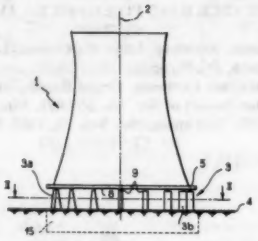
means for supporting said block member within said foot means for tilting and shifting movement with respect to said foot means; and

an upwardly extending threaded member having a lower threaded portion adjustably secured within said threaded bore within said block member, said threaded member having an upper portion supporting said wall panel support, means said threaded member thereby operatively supporting said panel support means on said foot means, whereby the height of said panel supporting means above said foot means can be adjusted by rotating said threaded member, and whereby said block member tilts and shifts to accommodate tilting and shifting of said threaded member with respect to said foot means to prevent said threaded member from jamming within said block member, said threaded member including an upper end defining chuck means for receiving a rotatable driving tool, said panel support means defining aperture means aligned with said threaded member for providing access to said chuck means, whereby said threaded member can be relatively rapidly rotated by applying a rotatable driving tool to said chuck means through said aperture means and rotating the tool.

4,555,881
STACK, PARTICULARLY ATMOSPHERIC COOLING TOWER

René Bordet, Courbevoie; Yves Grovalet, Chaville; Lionel Caudron, Croissy sur Seine, and Marius Diver, Les Essarts Le Roi, all of France, assignors to Service National Electricite de France, Paris, France

Continuation of Ser. No. 359,779, Mar. 19, 1982, abandoned.
This application Apr. 16, 1985, Ser. No. 722,769
Claims priority, application France, Mar. 20, 1981, 8105641
Int. Cl.[4] E04B *1/36*
U.S. Cl. 52—167 20 Claims

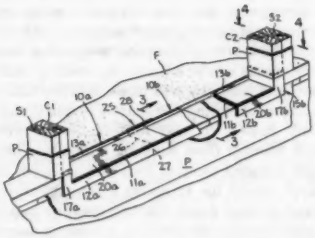


1. An atmospheric cooling stack comprising:
a shell having double curvature, said shell being made of reinforced concrete,
a seating separate from said shell said shell being spaced from said seating and said shell being supported by said seating;
a rigid peripheral ring portion integral with said shell for resisting deformation of said shell due to external forces, said ring portion being located at a base of said shell and said ring portion taking up shearing stress in said shell, balancing horizontal thrusts in said shell and transmitting shearing forces to said seating, a lower face of said rigid peripheral ring portion being flat and extending beyond a periphery of said double curvature; and
means interposed between said rigid peripheral ring and said seating for transmitting vertical and horizontal efforts of said shell to said seating and allowing thermal dilation of said shell.

4,555,882
MOISTURE GUARD FOR WINDOW FRAMES, DOOR JAMBS AND THE LIKE

Gregory A. Moffitt, 24993 Skyland Rd., and Glenn E. Brown, 24040 Summit Rd., both of Los Gatos, Calif. 95030

Filed Oct. 20, 1983, Ser. No. 543,607
Int. Cl.[4] E06B *1/04*
U.S. Cl. 52—204 14 Claims

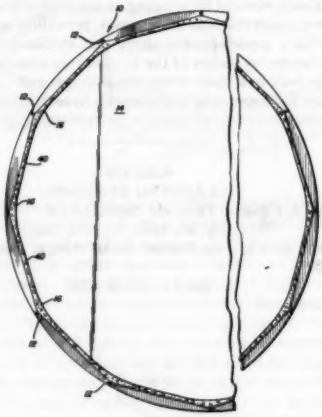


1. A moisture guard adaptable for seating on a threshold and on which a door frame, window frame or the like is installed to inhibit moisture from seeping into the interior of a building, which frame includes a sill and spaced upright members at opposite ends of the sill, said moisture guard comprising:
(a) a base adaptable for seating on the threshold and on which the sill of the frame is supported;
(b) a depending side flange at the front edge of said base for engaging the threshold;
(c) an upstanding side flange at the rear edge of the base for providing a barrier to inhibit moisture from seeping into the interior of the building; and
(d) and end flange at an end edge of the base for engaging an upright member of the frame, said end flange comprising an upstanding end wall and a vertical side wall.

4,555,883
HOOP BEAM EQUIPPED PRECAST SILO CONSTRUCTION

Carl F. Agsten, 1539 Bedford Rd., Charleston, W. Va. 25314, and Willis C. Haworth, 3515 Staunton Ave., Charleston, W. Va. 25304

Filed Aug. 18, 1983, Ser. No. 524,239
Int. Cl.[4] E04H *12/28*
U.S. Cl. 52—245 13 Claims



1. An upright generally cylindrical structure including a plurality of peripherally spaced upstanding structural members relatively anchored at their lower ends, each structural member including an upstanding horizontally elongated main wall member supported therefrom and extending vertically therealong, said main wall members projecting horizontally laterally from the corresponding structural member in opposite directions toward the peripherally adjacent structural members, adjacent ends of said main wall members being spaced apart, horizontally elongated peripheral structural members anchored relative to and extending between adjacent upstanding structural members closely outwardly of said main wall members, the end edges of each of said main wall members being bevelled and together forming an included angle greater than the included angle between radial planes of said cylindrical structure containing said end edges, connecting wall members extending between adjacent spaced end edges of said main wall members and including bevelled end edges corresponding to the bevelled end edges of said main wall members, and fastener means connected between said connecting wall members and said peripheral structural members operative to draw said connecting wall members outward toward said peripheral structural members and into seated position between adjacent bevelled edges of said main wall members.

4,555,884
PLASTIC GLAZING PROFILE DESIGNED FOR GLAZING WINDOW-FRAMES

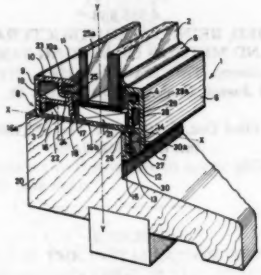
Piet van Eerden, Le Dedemsvaart, Netherlands, assignor to Wavin B.V., Zwolle, Netherlands

Continuation of Ser. No. 328,020, Dec. 7, 1981. This application Feb. 3, 1984, Ser. No. 576,887

Claims priority, application Netherlands, Sep. 12, 1980, 8006689

Int. Cl.⁴ E04B *1/62*

U.S. Cl. 52—397 **2 Claims**



1. A plastic glazing profile for mounting a glass pane in a wooden window frame comprising

a supporting surface adapted to be fixed to a wooden window frame, a first pair of inner- and outer-most spaced-apart flanges upstanding from said supporting surface, therewith forming an upright double wall glass pane abutment having a cavity adapted to accommodate a sealing flap, a second pair of spaced-apart flanges upstanding from said supporting surface on the side opposite said glass pane, a downwardly depending flange engagable with the window frame and being offset inwardly relative to said first innermost flange upstanding from said supporting surface,

a duct-like element for fixing a glass plane edge positioned at the other side of said profile having at the abutment side of the glass a glass-sealing flap, said duct-like element having two downwardly depending flanges positioned for snap engagement with said second pair of spaced-apart flanges to anchor said glass pane to said supporting surface, said supporting surface having frame attachment openings therethrough, said plastic glazing profile having inertia moments I_x lying within a range of from 1 to 8 and I_y lying between 9 and 30 when viewed from an axis I_y drawn through the center of gravity of the profile and wherein the I_x axis is parallel to the horizontal supporting surface.

4,555,885
FILLER STRIP WITH LOCKING CLIP

Ronald P. Raymond, Chagrin Falls, and William C. Andrick, Uniontown, both of Ohio, assignors to Polymer/Raymond Industries, Inc., Middlefield, Ohio

Filed May 5, 1983, Ser. No. 491,862

Int. Cl.⁴ E04C *1/34*

U.S. Cl. 52—468 **15 Claims**

1. A filler strip in combination with a wall having a gap for closing the gap, said filler strip comprising:

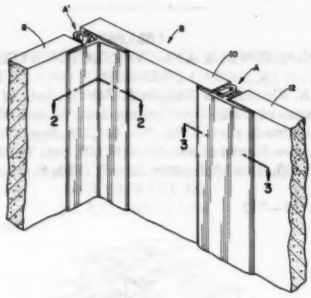
a first flange sized for overlapping engagement to a first contiguous shoulder of the wall;

a second flange sized for overlapping engagement to a second contiguous shoulder of the wall;

an intermediate protuberance integrally formed with said flanges, depending from said first and said second flanges and including first means for gripping engagement to the wall;

a selectively insertable locking pressure clip including second means for gripping wall gap shoulder opposite of said first means; and,

an extended receiving slot for selectively receiving said clip; said protuberance and locking pressure clip being sized for compressive deflection and retention in said gap by engagement to the wall gap shoulders, and said protuberance and locking clip being received in the gap to an extent defined by generally flush engagement of said flanges to said wall whereby upon the compressive retention of said clip and said protuberance in said gap said filler strip closes said gap.



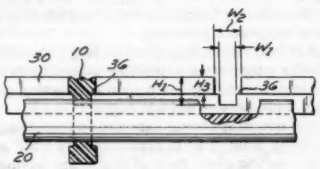
4,555,886
METHOD OF MANUFACTURING AND ASSEMBLING A GRATING CONSTRUCTED OF RESIN BONDED FIBERS

Joseph W. Wiechowski, San Clemente, Calif., assignor to Poly-Trusions, Inc., Santa Ana, Calif.

Filed Jan. 5, 1984, Ser. No. 568,298

Int. Cl.⁴ E04C *2/42*

U.S. Cl. 52—667 **65 Claims**



16. A grating comprising, in combination:

(a) a plurality of elongate I-beams each having a plurality of apertures therein, the respective apertures in said I-beams being in registry, the I-beams being comprised of an upper portion of a greater width and a lower portion of lesser width under the upper portion, the greater and lesser width forming an overhang under the upper portion and the adjacent lower portion;

(b) a plurality of notched cross-bars having an upper portion and a lower portions, said cross-bars having a plurality of notches, the notches therein being in registry, each notch having an upper notch portion and a lower notch portion forming a shoulder therebetween;

(c) a plurality of dowels having a diameter substantially the diameter of the apertures in the I-beams and having a key slot formed longitudinally therein substantially equal to that width of the lower portion of the cross-bars;

(d) said notched cross-bars extending through a plurality of respectively registered apertures in a plurality of said I-beams, the shoulders thereon engaging in the overhang of the I-beams, fixing said I-beams longitudinally side by side in generally parallel relationship one to another; and

(e) said dowels secured substantially perpendicular to the length and height of the I-beams through the apertures therethrough, the key slot in the dowels receiving the lower portions of the cross-bars, the interengaging shoulder and overhang and the keyed dowel cooperating to prevent rotation of the dowel in the apertures and tilting of the I-beams.

4,555,887

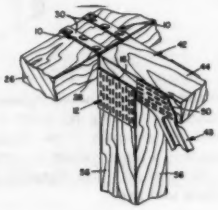
TRUSS ASSEMBLY AND CONNECTOR FOR USE WITH TRUSSES

Carlos S. Rionda, and Joaquin J. Palacio, both of Miami, Fla., assignors to Gang-Nail Systems, Inc., Miami, Fla.

Continuation-in-part of Ser. No. 424,216, Sep. 27, 1982, and a continuation-in-part of Ser. No. 423,169, Sep. 24, 1982, Pat. No. 4,455,805. This application Jan. 7, 1983, Ser. No. 456,340

Int. Cl.⁴ F16B *5/00*

U.S. Cl. 52—712 **4 Claims**



1. A floor truss assembly comprising:

(a) a floor truss structure extending in a first direction and having first and second sides;

(b) a wooden beam having two sides, a top and a bottom, and extending in a direction transverse to said truss structure;

(c) a pair of connector hangers fixedly connecting said truss structure to said wooden beam, each of said connector hangers including a connecting plate and a strap, and said pair of connector hangers being of like construction but of mirror image configuration;

(d) each of said connecting plates having a plurality of sharp teeth-like projections extending generally orthogonally from said connecting plate, said connecting plates each having a plurality of outside edges;

(e) each of said straps being joined to an outside edge of said connecting plate to form approximately a 90° angle with said connecting plate, each of said straps having a pair of elongated sides and extending the entire length of the edge of said connecting plate to which said strap is joined and projecting beyond said connecting plate to provide a surface for nailing or like fastening said strap to said wooden beam, each of said straps being joined to said associated connecting plate along one of the elongated sides, said teeth-like projections extending in a direction so as to overlie said strap;

(f) each of said straps being bent into a generally U shape so as to have first, second and third sections, said first section extending along the length of the edge of said connecting plate to which the strap is attached and extending beyond said edge to provide a substantial portion of said first section which offsets the second section of the strap from the top of said connecting plate, said first section being connected to a first side of said wooden beam, said second section being connected to the top of said wooden beam and said third section being attached to a second side of the wooden beam, the first, second and third sections of the strap of one of said hangers being parallel to the corresponding first, second and third sections of the strap of the other hanger; and

(g) the connecting plate of said first connector hanger being attached to a first side of the truss by embedment of the tooth-like projections within the first side of the truss in proximity to the end of the truss and said connecting plate of said second connector hanger being attached to a second side of the truss by embedment of the teeth-like projections within the second side of the truss in proximity to the end of the truss, with the connecting plates being opposed to each other, said connecting plates being positioned with respect to said truss so that the first sections of the straps are positioned between the truss and the beam.

4,555,888

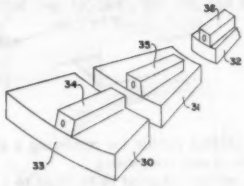
PREFORMED, REINFORCED STRUCTURAL PANELS AND METHOD OF MAKING SAME

Joseph Goldenberg, 1707 East West Hwy., Hyattsville, Md. 20783, and Joseph Cooke, 1015 Chestnut St., Philadelphia, Pa. 19103

Filed Dec. 6, 1982, Ser. No. 447,108

Int. Cl.⁴ E04B *2/56*

U.S. Cl. 52—722 **20 Claims**



1. A method for forming a reinforced concrete structural panel having a finished slab surface and an opposed slab surface to which at least one pre-stressed structural reinforcing member is reinforcingly abutted, which comprises:

(a) casting concrete into a mold having a molding surface corresponding to a desired finished slab shape and surface texture to form an uncured concrete slab;

(b) implanting a plurality of joiner means projecting from a surface of at least one longitudinally pre-stressed structural reinforcing member into the uncured concrete slab to abut the uncured slab against the pre-stressed reinforcing member along the surface of the reinforcing member from which the joiner means project; and

(c) curing the concrete slab without pre-stressing it while the joiner means is thusly implanted to form said reinforced concrete structural panel.

4,555,889

COLLAPSIBLE WALL STUD AND BUILDING SYSTEM

Leonard E. Mankowski, Ithaca, N.Y., assignor to Cornell Research Foundation, Inc., Ithaca, N.Y.

Filed Jul. 31, 1984, Ser. No. 636,432

Int. Cl.⁴ E04C *3/30*

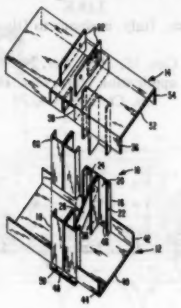
U.S. Cl. 52—726 **19 Claims**

1. A collapsible wall stud and building system for use in constructing a building, said collapsible wall stud and building system comprising:

a collapsible wall stud having spaced, generally parallel outer and inner channel members, said channel members being connected to each other by spaced, transverse pivot arms and movable between open and closed positions;

at least first and second wall panels, end portions of said wall panels being receivable between said outer and inner channel members in said open position and being engaged by said outer and inner channel members in said closed position to form a wall section;

means to secure a lower portion of said collapsible wall stud to a floor portion of the building; and



means to secure a roof structure to upper positions of said collapsible wall studs.

4,555,890

PROCESS FOR THE INSTALLATION OF CURTAIN WALLS AND APPARATUS FOR THE EXECUTION OF THE PROCESS

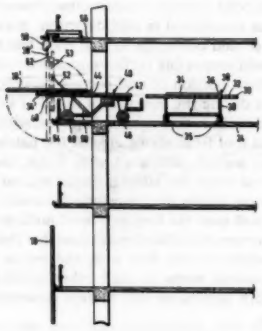
Fritz Gartner, Gundelfingen, Fed. Rep. of Germany, assignor to Josef Gartner & Co., Gundelfingen, Fed. Rep. of Germany

Filed Sep. 29, 1982, Ser. No. 426,920

Claims priority, application Fed. Rep. of Germany, Oct. 15, 1981, 3141047

Int. Cl.⁴ E04B *1/00*

U.S. Cl. 52—745 **14 Claims**



1. A process for assembling and installing a curtain wall on a frame of a building wherein one or more floor portions have been established at an above ground level characterized in that components of of the curtain wall, including posts and tie bars, glazing, facade panels, and the like, are delivered to and provided within the building, at a level represented by a floor portion thereof, on said floor portion a plurality of said components including posts and tie bars are assembled into a section of said curtain wall, said section is secured to an auxiliary structure and moved therewith, by means of a mobile carrier, across said floor portion to a location thereon adjacent an exterior of said building where said auxiliary structure is engaged to transfer means mounted on the frame of said building, positioned immediately outward thereof, said auxiliary structure together with the section of the curtain wall secured thereto are then moved, by means of said transfer means, in a path substantially adjacent to the exterior of the building to the location required for the curtain wall's application, where the curtain wall is pulled into its required position and there fastened in connection with the frame of said building, said auxiliary structure is then released from the section of said curtain wall so installed and, utilizing said transfer means to which it is still engaged, moved back to a floor portion of said building for similar use in a similar manner.

4,555,891

APPARATUS FOR FITTING TOGETHER CUP-LIKE CONTAINERS AND PACKAGING CARRIERS WHICH ENGAGE SAME

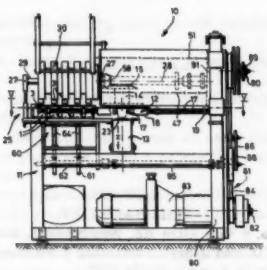
Ernst F. Sauerbruch, Gewerbestrasse 31, D-7702 Gottmadingen, Fed. Rep. of Germany

Filed Oct. 18, 1983, Ser. No. 543,022

Claims priority, application Fed. Rep. of Germany, Oct. 19, 1982, 3238698

Int. Cl.⁴ B65B *27/04*

U.S. Cl. 53—48 **22 Claims**



1. An apparatus for fitting and engaging cup-like containers in packaging carriers comprising:

indexing means for moving said cup-like containers from a first station wherein said containers are associated with said indexing means to a second station wherein said containers are fitted and engaged in said packaging carriers to a third station wherein said packaging carriers with containers are disassociated with said indexing means;

conveyor means for feeding said containers to said indexing means at said first station and removing said packaging carriers with containers from said indexing means at said third station; and means associated with said second station for feeding and fixing said packaging carriers to said containers and said second station.

4,555,892

APPARATUS FOR PLACING CONES IN A BOX

Berend J. Dijkman, Deventer, Netherlands, assignor to Thomassen & Drijver-Verblifa N.V., Deventer, Netherlands

Filed Nov. 28, 1983, Ser. No. 555,405

Claims priority, application Netherlands, Nov. 30, 1982, 8204648

Int. Cl.⁴ B65B *5/08, 35/44, 35/50, 35/56*

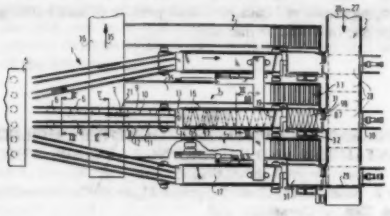
U.S. Cl. 53—142 **18 Claims**

9. In a system for packaging generally conical articles each having an enlarged top and a narrow tip, the combination of:

conveyor means for conveying the articles along a common path with the articles lying on their sides in a spaced sequence aligned in said path in which serially successive articles are disposed in top-to-tip relation;

stop means in said path for causing said spaced sequence of articles sequentially to be grouped into a contiguous sequence thereof in said top-to-tip relation; and

transfer means for transferring a group of articles having a particular orientation relative to said conveyor means



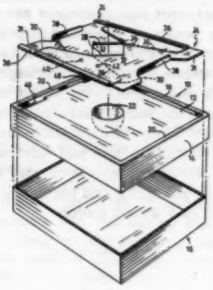
from said contiguous sequence as a layer of articles in a receptacle therefor.

4,555,893

FISH BAIT TIER

Nori Nakata, 6 Van Allan Rd., Scarborough, Ontario, Canada (M1G 1C2), and Joseph Melanson, 1 Haddon St., Scarborough, Ontario, Canada (M1N 2K7)

Filed Mar. 5, 1984, Ser. No. 586,421
Int. Cl.[4] B65B *11/02, 47/04*
U.S. Cl. 53—390 **15 Claims**



1. Device for enclosing fish bait comprising:

a base,

means defining an upwardly opening well having sides and bottom in said base dimensioned to receive nylon mesh and some bait therein,

a pair of horizontally arranged metal plates and means mounting each said plate for movement to enable said plates to slide in a horizontal relative longitudinal sliding direction over one another in side by side relationship,

said plates being designed to slide relative to each other in said sliding direction between an open and a closed limiting position,

wherein, in said open position, said plates are shaped together to define an aperture aligned with said well,

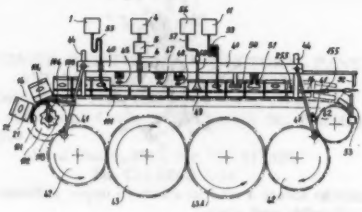
and in said closed position said plates substantially close said aperture over said well.

4,555,894

APPARATUS FOR MAKING STRIPS OF COHERENT PACKETS CONTAINING GROUND COFFEE OR THE LIKE

Ernesto Illy, Trieste, Italy, assignor to Illycaffè S.p.A., Trieste, Italy

Filed Oct. 15, 1984, Ser. No. 660,919
Claims priority, application Italy, Oct. 18, 1983, 23345 A/83
Int. Cl.[4] B65B *1/24*
U.S. Cl. 53—528 **20 Claims**



1. In an apparatus for making a strip of coherent packets containing batches of metered quantities of flowable solid material, particularly coffee, between overlapping first and second elongated webs at least one of which includes a liquid-permeable material, the combination of an endless conveyor comprising a series of mobile plates having supporting surfaces; means for intermittently advancing said conveyor in a predetermined direction along a predetermined path having a section wherein the supporting surfaces of said plate face upwardly; means for depositing successive increments of the first web on the supporting surfaces of successive plates in a first portion of said section; means for feeding batches onto the first web in a second portion of said section downstream of said first portion, as considered in said direction, during the intervals of dwell of said conveyor so that each batch is disposed above one of said supporting surfaces; means for densifying the batches in a third portion of said section downstream of said second portion during the intervals of dwell of said conveyor, including at least one rotary compacting tool, adjustable means for biasing said tool from above against the batch in the third portion of said section with a variable force, and means for rotating said tool while the latter is biased against the batch in said third portion; means for depositing successive increments of the second web onto the first web in a fourth portion of said section downstream of the third portion so that the second web overlies the batches on the first web; and means for bonding the first and second webs to each other around successive batches in a fifth portion of said section downstream of said fourth portion.

4,555,895

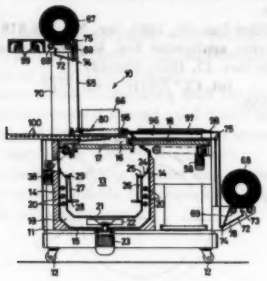
MACHINE FOR PACKAGING PRODUCTS IN HEAT-SHRINKABLE FILM

Francesco Torre, Via Baschenis 3, Dalmine (Bergamo), Italy

Filed Dec. 5, 1983, Ser. No. 557,932
Claims priority, application Italy, Dec. 13, 1982, 24719 A
Int. Cl.[4] B65B *53/06, 11/48*
U.S. Cl. 53—557 **14 Claims**

1. A machine for packaging products in a heat-shrinkable film comprising a structure, means on said structure to mount rolls of film to wrap said product, a chamber mounted on said structure and means for shrinking the film about a wrapped product positioned in said chamber, said chamber having a base, sidewalls and an aperture at its top, a platform for said product mounted on said structure which is lowerable into said chamber and which covers said aperture when fully raised, means on said structure to lower and raise said platform, a lateral panel horizontally movable mounted on said structure

which covers said aperture when said platform is in a lowered position and welding means mounted on said structure to weld



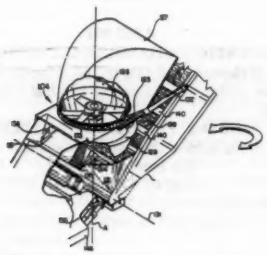
two opposing edges of said film together when said platform and product are positioned within said chamber.

4,555,896

CANE HARVESTER

Rodney A. Stiff; Malcolm J. Baker, and Leslie J. Lester, all of Bundaberg, Australia, assignors to Versatile Corporation, British Columbia, Canada

Filed Sep. 24, 1982, Ser. No. 423,262
Claims priority, application Australia, Nov. 20, 1981, PF1633
Int. Cl.[4] A01D *45/10*
U.S. Cl. 56—13.9 **9 Claims**



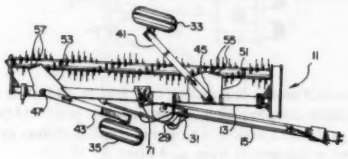
1. A sugar cane harvester comprising feed means, cutting means to sever crop after it has entered said feed means, conveying rollers to convey said crop to a chopping means following the severing of said crop by said cutting means, said chopping means cutting said crop after said crop has been conveyed to said chopping means by said conveying rollers, and cleaning means to clean said crop, said cleaning means comprising a cleaning cylinder, an extractor fan positioned in the upper portion of said cleaning cylinder, substantially unobstructed air intake means located outwardly of and surrounding a substantial portion of the periphery of said cleaning cylinder, said air intake means being operative to draw air in a generally downwardly direction through said air intake means and into said cleaning cylinder and in a generally upwardly direction through a substantial portion of said crop after said crop exits from said chopping means, and conveying means having a receiving area for receiving and conveying cut crop from said cleaning means, said conveying means being rotatable about an axis and said receiving area of said conveying means being located substantially directly below said extractor fan.

4,555,897

TRANSPORTABLE WIDE SWATH TRAILING IMPLEMENT

Wilfred J. Degelman, Regina, Canada, assignor to Degelman Industries Ltd., Regina, Canada

Filed Mar. 27, 1984, Ser. No. 593,809
Claims priority, application Canada, Jan. 13, 1984, 445265
Int. Cl.[4] A01B *73/00*
U.S. Cl. 56—228 **14 Claims**



1. A transportable trailing wide-swath wheel-supported implement comprising

a wide-swath frame for supporting at least one working element;

a drawbar pivotally connected to the frame about a substantially vertical pivotal axis;

at least two wheel legs each having an inner end pivotally mounted on the frame about a substantially vertical pivotal axis; and

an implement-supporting wheel mounted for rotation about a substantially transverse horizontal axis on the outer end of each of said wheel legs;

the wheel legs and drawbar each being pivotally movable to assume selectably a retracted position at a relatively small acute angle to the swath dimension of the frame and an extended position at a relatively large acute angle or right angle to the swath dimension of the frame, thereby permitting the effective transverse width of the implement to vary between a relatively small transport mode dimension in the retracted position of said drawbar and wheel legs and a relatively large working mode dimension in the extended position of said drawbar and wheel legs;

wherein the pivotal connection to the frame of one of said wheel legs is located on the side of the frame opposite that on which the pivotal connection of another of said wheel legs is located, and the pivotal connection for the drawbar is located generally centrally along the frame between the locations of the pivotal connections of the wheel legs, and wherein the wheel legs in extended position extend generally rearwardly of the frame whilst the drawbar in extended position extends generally forwardly of the frame; and

wherein one of the wheel legs swings generally inwardly through an angle less than a right angle to move from extended to retracted position whilst the other of the wheel legs swings from rearward to generally forward orientation through an angle of the order of 180° or more to move from extended to retracted position.

4,555,898

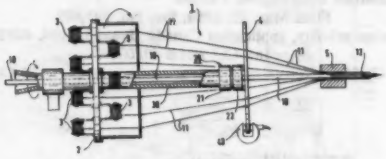
APPARATUS FOR STRANDING ARMOR WIRES ABOUT A CABLE CORE, AND METHOD IMPLEMENTED BY THE APPARATUS

Jean-Luc Canivet, Oye Plage, France, assignor to Les Cables de Lyon, France

Filed Aug. 22, 1984, Ser. No. 643,325
Claims priority, application France, Aug. 22, 1983, 83 13539
Int. Cl.[4] D07B *7/02, 7/06*
U.S. Cl. 57—19 **5 Claims**

1. Apparatus for stranding armor wires about a cable core, said apparatus comprising a rotary plate equipped with armor wire bobbins bearing armor wire, a rotary distributer grid,

means connecting said grid to said plate such that said grid is driven by the plate, and a stranding die for bringing together the armor wires around the cable core, the improvement



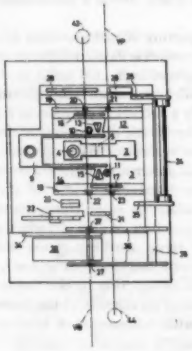
wherein said means connecting said grid to said plate includes a detachable coupling situated between the plate and the distribution grid, and a brake for stopping the distribution grid when said grid is uncoupled from said plate.

4,555,899

SPUN YARN SPLICING DEVICE

Hiroshi Mima, Kyoto, Japan, assignor to Murata Kikai Kabushiki Kaisha, Japan

Filed Oct. 28, 1982, Ser. No. 437,268
Claims priority, application Japan, Oct. 29, 1981, 56-173574
Int. Cl.⁴ B65H *69/06;* **D01H** *15/00;* **D02J** *1/08*
U.S. Cl. 57—22 **8 Claims**



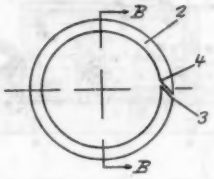
1. A spun yarn splicing device comprising a yarn splicing member having a body with opposed sides, the splicing member body including a yarn splicing hole extending between said opposed sides, a fluid ejection nozzle for ejecting compressed fluid into said yarn splicing hole, the fluid ejection nozzle opening into the yarn splicing hole, and a slit opening into said yarn splicing hole for guiding untwisted yarn ends to be spliced into said yarn splicing hole, said yarn splicing hole being circular in cross section, said slit being directed tangentially to said yarn splicing hole and connected thereto at a junction, wherein said fluid ejection nozzle opens toward a central axis of said yarn splicing hole, wherein the opening of the fluid ejection nozzle has a cross-sectional shape elongated in an axial direction of said yarn splicing hole, wherein the device further includes initial positioning means for initially positioning untwisted yarn ends to be spliced within said yarn splicing hole diametrically opposite the tangential slit and away from the linear direction of travel of the fluid so that the initial contact of the fluid with the yarn ends to be spliced is from a stream of fluid deflected from the portion of the wall of the splicing hole opposite the fluid ejection nozzle opening, and whereby the yarn ends in said yarn splicing hole can be spliced together by introducing the compressed fluid from said fluid ejection nozzle into said yarn splicing hole.

4,555,900

BALLOONING ACTION CONSTRAINING RING

Lothar Klug, Elsenfeld, and Klaus Schmuck, Erlenbach, both of Fed. Rep. of Germany, assignors to Akzo N.V., Arnhem, Netherlands

Filed Dec. 28, 1983, Ser. No. 566,819
Claims priority, application Fed. Rep. of Germany, Dec. 28, 1982, 3248238; Nov. 17, 1983, 3341489
Int. Cl.⁴ D01H *1/42, 7/18*
U.S. Cl. 57—355 **17 Claims**



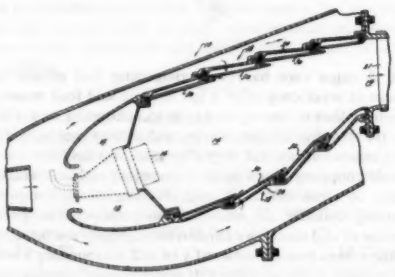
1. In a constraining ring of the type used in the working up of fibers to prevent ballooning action thereof, the improvement wherein said ring is composed of a raw material suitable for absorbing lubricants, said ring having a thread contact surface which reduces the friction load of a thread by means of the thread contact surface, and wherein said raw material absorbs a lubricant to at least 15% of its volume, whereby absorption of the lubricant is completed at the earliest after about 15 minutes, and at least a surface of said ring which contacts with a thread is composed of said raw material, said ring having an average hydrodynamic pore diameter of said raw material between 5 and 25 μm and a preponderant portion of said thread contact surface displays pores.

4,555,901

COMBUSTION CHAMBER CONSTRUCTION

Thomas G. Wakeman, and Harvey M. Maclin, both of Cincinnati, Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed Dec. 19, 1972, Ser. No. 316,532
The portion of the term of this patent subsequent to Nov. 6, 2001, has been disclaimed.
Int. Cl.⁴ F02C *7/20*
U.S. Cl. 60—39.32 **9 Claims**



1. A combustion chamber for use in gas turbine engines, the chamber comprising:

an inlet for receiving air and fuel to be burned;

an outlet for expelling products of combustion;

high strength structural frame means disposed between the inlet and the outlet for supporting mechanical forces associated with the chamber;

liner means cooperating with the frame means and defining

a combustion zone, said liner means including a plurality of panels of high temperature material;

axial mounting means for positioning said panels axially with respect to said frame means, said axial mounting means including:

first shoulder means cooperating with preselected of said panels, and partially defining a circumferential slot of first predetermined axial width therein;

second shoulder means cooperating with the frame means;

a flange of predetermined second axial width less than said first width, said flange formed upon said second shoulder means for disposition within the slot; and

a circumferentially extending retainer ring of predetermined third axial width suitable for disposition, together with said flange, within said slot.

4,555,902

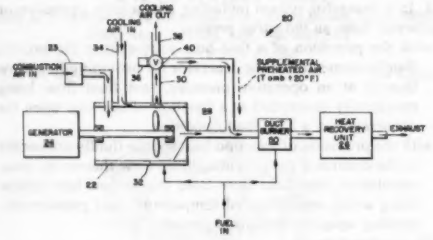
HEAT RECOVERY SYSTEM

Karol Pilarczyk, Loudonville, N.Y., assignor to Vevy Manufacturing Inc., Latham, N.Y.

Filed Jan. 16, 1984, Ser. No. 570,882

Int. Cl.⁴ F02C *7/08;* F02G *1/00*

U.S. Cl. 60—39.5 **8 Claims**



1. In a power generating system utilizing a gas turbine engine including an outer enclosure and a power turbine, a primary mode of operation with the power turbine operationally connected to a generator for driving said generator to produce electricity, and a secondary mode of operation with a heat recovery unit located downstream of said gas turbine engine and including first duct means for confining flow of exhaust gases from said gas turbine engine to said heat recovery unit, the improvement comprising:

second duct means for confining flow of ambient ventilation air used to cool said outer enclosure after the ventilation air passes through and around said outer enclosure, the ventilation air thereby becoming heated; said second duct means communicating with said first duct means downstream of said gas turbine engine;

flow inducing means for drawing the ventilation air through said second duct means and into said first duct means;

said second duct means including an outlet to direct the ventilation air out of said system; and a diverter valve selectively movable between first and second positions such that, in said first position, the ventilation air is drawn through the outlet and exhausted from said system, and in said second position, the ventilation air is drawn into said first duct means downstream from said gas turbine engine; and

a duct burner in communication with said first duct means intermediate said gas turbine engine and said heat recovery unit, said duct burner including means for the addition of fuel and the ignition of said additional fuel in the presence of unburned oxygen from the turbine exhaust as well as fresh oxygen from the ventilation air.

4,555,903

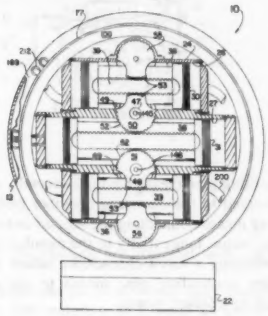
INTERNAL COMBUSTION TURBINE ENGINE

William C. Heaton, Flomaton, Ala., assignor to Ronald P. Howell, Brewton, Ala., a part interest

Continuation-in-part of Ser. No. 400,071, Jul. 20, 1982, Pat. No. 4,449,488, which is a division of Ser. No. 157,517, Jun. 9, 1980, Pat. No. 4,344,288. This application Apr. 6, 1984, Ser. No. 597,495

Int. Cl.⁴ F02B *71/04*

U.S. Cl. 60—595 **8 Claims**



1. An internal combustion engine comprising:

an engine block defining therein a central cylinder and a pair of auxiliary cylinders positioned on opposite sides of said central cylinder;

central double acting piston means slidably positioned within said central cylinder and a pair of auxiliary double acting piston means slidably positioned within said auxiliary cylinders;

coordinating gear means for interconnecting said central piston means to each of said auxiliary piston means and for limiting the sliding movement of said auxiliary piston means to reciprocation at the same speed in opposite direction to the sliding movement of said central piston means;

first circular gear means rotatably mounted about an axis passing through the center of said central piston means;

a pair of second circular gear means positioned to engage said first circular gear means; and

a pair of articulated arm means, rigidly connected at one end thereof to one of said coordinating gear means and pivotally connected at the other end thereof to an eccentric point on one of said second circular gear means, for rotating said first circular gear means about said axis in response to operation of said piston means.

4,555,904

ARRANGEMENT OF AN EXHAUST-GAS RETURN SYSTEM FOR AN INTERNAL-COMBUSTION ENGINE HAVING AN EXHAUST-GAS TURBOSUPERCHARGER

Hans-Harald Melzer, Neufahrn, and Wolf-Dieter Spindeböck, Pfaffenhofen, both of Fed. Rep. of Germany, assignors to Bayerische Motoren Werke AG, Fed. Rep. of Germany

PCT No. PCT/EP82/00149, § 371 Date Mar. 14, 1983, § 102(e) Date Mar. 14, 1983

PCT Filed Jul. 10, 1982, Ser. No. 491,425

Claims priority, application Fed. Rep. of Germany, Jul. 16, 1981, 3128040

Int. Cl.⁴ F02B *37/00;* F02M *25/06*

U.S. Cl. 60—605 **2 Claims**

1. For an internal combustion engine having an exhaust turbocharger comprising an exhaust turbine having a hot gas inlet and a charged-air compressor,

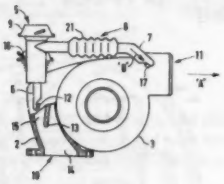
a turbine housing for the exhaust turbine having a first wall

and a separating wall to form a damming chamber means between the first and separating walls,

a charged-air guiding means for the charged-air compressor comprising an annular chamber means,

an exhaust-gas return means comprising

a connecting pipe means comprising plural pipe sections and a control valve,



the connecting pipe means having two ends, a first of which is connected to the damming chamber means, and

connecting means connecting the second end of the connecting pipe means tangentially to the annular chamber means for generating a screw-thread-like inflow of exhaust gas from the connecting pipe means to the output of the charged-air guiding means.

4,555,905

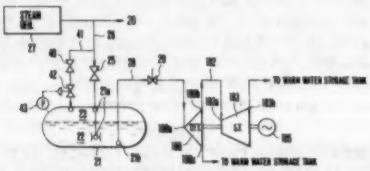
METHOD OF AND SYSTEM FOR UTILIZING THERMAL ENERGY ACCUMULATOR

Hajime Endou, Tokyo, Japan, assignor to Mitsui Engineering & Shipbuilding Co., Ltd., Japan

Continuation of Ser. No. 461,018, Jan. 26, 1983, abandoned. This application Mar. 18, 1985, Ser. No. 713,570

Int. Cl.[4] F01K *3/00*

U.S. Cl. 60—659 **4 Claims**



1. A thermal energy storage type power generating system utilizing hot water, comprising:

a thermal energy accumulator to store hot water;

a total flow turbine driven by hot water supplied from said accumulator;

a steam turbine driven by steam supplied from said total flow turbine;

power generator means for power generation connected to and driven by said total flow turbine and said steam turbine; and

a steam supplying device for supplementing make-up amounts of steam required to maintain temperature and pressure of hot water in said accumulator constant at all times.

4,555,906

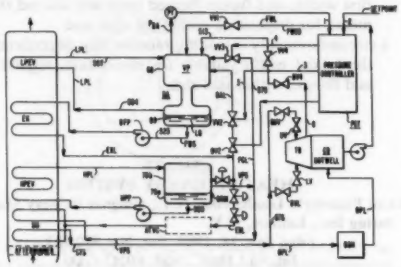
DEAERATOR PRESSURE CONTROL SYSTEM FOR A COMBINED CYCLE STEAM GENERATOR POWER PLANT

Alan Martens, Berwyn, and Gerry A. Myers, Swarthmore, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 25, 1984, Ser. No. 664,639

Int. Cl.[4] F01K *13/02*

U.S. Cl. 60—660 **9 Claims**



1. In a deaerator system including a deaerator operative on feedwater from an industrial process,

with the provision of a first heat source from the process fluidly connected to the deaerator for providing fluid flow thereto at an operative pressure, said fluid flow being operatively controlled as a function of the load upon the occurrence of a high load condition,

with the provision of a second heat source fluidly connected to the deaerator for providing fluid flow thereto by auto-circulation, said fluid flow from the second heat source being under conditions of temperature and pressure depending upon the industrial process,

the combination of:

at least one additional heat source fluidly connected to the deaerator for providing fluid flow thereto before the occurrence of said high load condition;

means for sensing pressure in said deaerator; and

first control means responsive to said sensing means and operative on the fluid flow from said additional heat source for maintaining a minimum deaerator pressure before the occurrence of said high load condition; whereby said first control means becomes operative whenever the deaerator pressure tends to sink below said minimum.

4,555,907

CRYOPUMP WITH IMPROVED SECOND STAGE ARRAY

Allen J. Bartlett, Milford, Mass., assignor to Helix Technology Corporation, Waltham, Mass.

Filed May 18, 1984, Ser. No. 611,689

Int. Cl.[4] B01D *8/00*

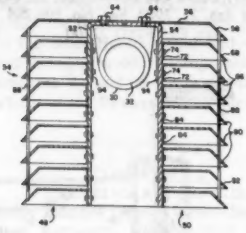
U.S. Cl. 62—55.5 **16 Claims**

1. A cryopump comprising a refrigerator having first and second stages, a second stage cryopanel in thermal contact with a heat sink on the second stage to condense low condensing temperature gases, a first stage cryopanel in thermal contact with a heat sink on the first stage and held at a temperature higher than the second stage to condense higher condensing temperature gases and a radiation shield surrounding the second stage cryopanel, the second stage cryopanel comprising:

axially extending, thermally conducting brackets independently mounted to and in close thermal contact with the second stage heat sink; and

fixed to each bracket, a respective array of baffle sections

spaced along the bracket, each array of baffle sections forming an independently mounted array section and the



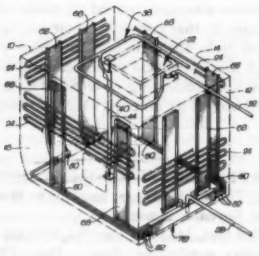
array sections together forming a full second stage cryopanel.

4,555,908

ADD-ON BRINE FLOW SYSTEM FOR REFRIGERATED TANK OF FISHING VESSEL

Earl A. Peterson, 4111 Chestnut Ave., Long Beach, Calif. 90807

Filed May 7, 1984, Ser. No. 607,511
Int. Cl.[4] F25D *17/02*
U.S. Cl. 62—64 **19 Claims**



1. A brine flow refrigeration system for use with a fishing vessel fish tank having fore, aft, inboard, outboard, overhead and deck bulkheads having refrigeration elements thereon, a brine circulation pump, a brine suction pipe at the bottom of the fish tank connected to the input of the brine circulation pump, and a brine discharge pipe located near the top of the fish tank connected to the output of the brine circulation pump; the improvement comprising:

an upper brine distribution manifold comprising an elongated, U-shaped, perforated pipe connected to the brine discharge pipe by a connecting pipe;

an interior distribution manifold comprising an elongated perforated pipe connected to the upper brine distribution manifold by a second connecting pipe, the upper and lower ends of the flexible perforated pipe being attached to the overhead and deck bulkheads, respectively;

a plurality of perforated flow course plates attached to selected ones of the plurality of refrigeration elements and extending vertically along the side bulkheads of the fish tank;

a suction manifold enclosing the brine suction pipe, having a plurality of pipes extending from its sides; and

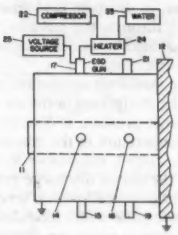
a plurality of flow course suction manifolds attached to each of said plurality of flow course plates, and connected to the suction manifold by said plurality of pipes.

4,555,909

METHOD AND APPARATUS FOR IMPROVED COOLING OF HOT MATERIALS

Meredith C. Gourdine, East Orange, N.J., assignor to Energy Innovations, Inc., East Orange, N.J.

Filed Sep. 6, 1983, Ser. No. 529,754
Int. Cl.[4] F25D *17/02*
U.S. Cl. 62—64 **38 Claims**



1. A method for cooling hot material with cooling fluid, comprising:

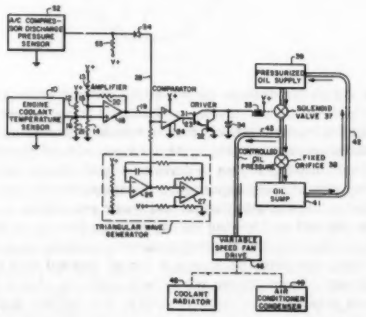
directing at least one jet of atomized fluid towards the surface of the hot materials at a speed μ_1 greater than the speed of fluid vapor $C_v/4$ leaving the surface of the hot material, and providing a fluid mass flow rate per unit area m_1/A from said jet to said material less than the rate at which vapor leaves the surface per unit area, $\rho_v C_v/4$, where ρ_v is the density of the vapor and C_v is the mean thermal speed of the vapor molecules to thereby prevent the formation of a fluid film on the material surface.

4,555,910

COOLANT/REFRIGERANT TEMPERATURE CONTROL SYSTEM

Fred D. Sturges, Rockford, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Jan. 23, 1984, Ser. No. 573,189
Int. Cl.[4] F01P *7/02*
U.S. Cl. 62—184 **6 Claims**



1. A coolant/refrigerant temperature control system for controlling the temperature of coolant flowing through the coolant radiator of an internal combustion engine in a vehicle and for also controlling the temperature of refrigerant flowing through the condenser of an air conditioning system for the vehicle thereby to control the refrigerant discharge pressure, the condenser being mounted in front of the radiator, said temperature control system comprising:

temperature sensing means for sensing the coolant temperature and producing a temperature signal having an amplitude proportional to the sensed coolant temperature;

a pulse width modulation circuit for developing, in response to said temperature signal, a pulse width modulated signal having a duty cycle which is proportional to the sensed coolant temperature;

means responsive to said pulse width modulated signal for producing a controlled fluid pressure which is a function of and represents the sensed coolant temperature;

a variable speed fan drive, controlled by the fluid pressure, for normally blowing a controlled amount of air through the condenser, to dissipate heat absorbed by the refrigerant, and then through the radiator, to dissipate heat absorbed by the coolant, as determined by the sensed coolant temperature;

pressure sensing means for sensing the compressor discharge pressure of the refrigerant in the air conditioning system, which discharge pressure is directly proportional to the refrigerant temperature in the condenser;

and an override circuit, responsive to said pressure sensing means when the sensed discharge pressure exceeds a predetermined maximum allowable level, for overriding the operation of the pulse width modulation circuit to change the fluid pressure as necessary to maximize the fan speed and thus the air pulled in through the condenser and radiator, thereby reducing the refrigerant temperature in the condenser and consequently the refrigerant discharge pressure.

4,555,911

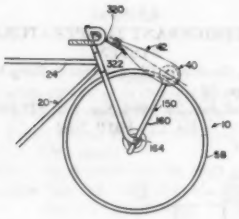
VEHICLE AIR CONDITIONER GROUND WHEEL DRIVEN

Ike W. Kusisto, P. O. Box 5913, Prescott Valley, Ariz. 86312

Filed Sep. 7, 1984, Ser. No. 648,384

Int. Cl.⁴ B60H *3/04*

U.S. Cl. 62—241 **7 Claims**



1. An air conditioner for mounting above a ground wheel of a vehicle such as a bicycle and having a frame, an air blowing means, a system wheel, means rotataby mounting said air blowing means and said system wheel on said frame so that said air blowing means is driven by said system wheel, said system wheel being exposed for engagement with said ground wheel, a housing attached to said frame and having an air inlet adjacent said air blowing means and also having an air outlet, said air blowing means being received in said housing whereby air from said blowing means is forced toward said outlet, at least part of said system wheel being outside of said housing, means attachable to such a vehicle for forcing said system wheel against said vehicle wheel, mounting means for mounting said frame on said vehicle and for pressing said system wheel against said ground wheel, said vehicle being a bicycle, said frame being disposable above the forward wheel of said bicycle, said mounting means comprising a pair of arms extendable upwardly from and attachable to the axle of the forward wheel of said bicycle, a top-holding means section interconnecting said arms, a pressing means interconnecting the upper side of said housing and said connecting means in a manner such that when said pressing means is raised with respect to said connecting means said housing will be pressed downwardly for pressing said system wheel drivably with said bicycle wheel.

4,555,912

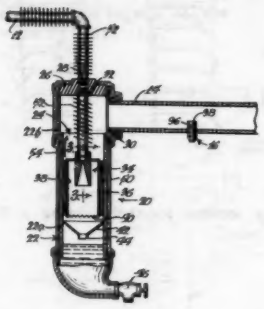
AIR HANDLING SYSTEM

Donald Bogosh, 437 Diana Ct., Bensenville, Ill. 60106

Filed Jun. 21, 1983, Ser. No. 506,289

Int. Cl.⁴ F25D *21/00*

U.S. Cl. 62—272 **18 Claims**



1. An air distribution system comprising a compressor having an outlet for providing compressed air to a distributing conduit, the improvement of a liquid condenser between said outlet and said conduit and comprising an elongated chamber, a tube connected to said outlet and extending into said elongated chamber, expansion orifice means arranged in said chamber and carried on a free end of said tube, means defining a condensing surface arranged around an outlet of said expansion orifice means so that compressed air received from said compressor will flow through said tube and expand while passing through said expansion orifice causing suspended liquid to collect on said condensing surface and be separated from said compressed air before entering said distributing conduit.

4,555,913

ICE PRODUCT MAKING MACHINE

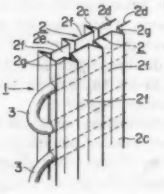
Fumio Ishiguro, Toyohashi, Japan, assignor to Hoshizaki Electric Co., Ltd., Toyoake, Japan

Filed Oct. 16, 1984, Ser. No. 661,328

Claims priority, application Japan, Oct. 17, 1983, 58-159379[U]

Int. Cl.⁴ F25C *1/12*

U.S. Cl. 62—347 **1 Claim**



1. A freezing mold for an ice product making apparatus comprising a pair of freezing plates mounted in opposition to each other and having a plurality of vertically extending and transversely spaced apart rib-like partitions which extend outwardly from the freezing surface of the freezing plates and which form vertically extending grooves on the back side of the freezing plates, said freezing plates having flat freezing sections defined between adjacent partitions, a cooling coil in direct mechanical contact with the back surfaces of the flat freezing sections of the freezing plates, and a flushing water feed pipe mounted on an upper portion of and between the freezing plates, and wherein the partitions and flat freezing

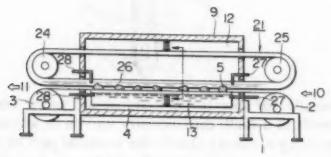
sections of the freezing plates are arranged in a staggered relation to each other in a manner such that the partitions and the flat freezing sections of one freezing plate respectively are directly opposite the flat freezing sections and partitions respectively of the other freezing plate and wherein flushing water supplied through the said flushing water feed pipe effectively contacts both the said vertically extending grooves and the back surfaces of the flat freezing sections of said freezing plates.

4,555,914

FREEZING APPARATUS

Noriharu Kanto; Yukihiro Hosaka; Yoshio Sasaki, all of Nagasaki; Tatsuo Kuramoto, Fukuoka, and Masato Kimura, Oomuta, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 8, 1983, Ser. No. 530,343
Claims priority, application Japan, Sep. 27, 1982, 57-170066
Int. Cl.[4] F25D *25/04*
U.S. Cl. 62—380 **11 Claims**



1. A freezing apparatus comprising a first and a second endless belt conveyor put one upon another, said first conveyor above said second conveyor, substantially horizontally so as to have confronting runs, means for driving said first and second conveyors to drive their confronting runs in the same direction, and means, including the conveyor belt of said first conveyor, for freezing products-to-be-frozen which are put between said contronting runs of said first and second conveyors while the products are conveyed by said first and second conveyors through said runs of the conveyor belts thereof by cooling them with said freezing means, the conveyor belt of said first belt conveyor being an endless elastic flexible belt capable of elastically holding the products between said confronting runs, said flexible belt being heat transmissive and conveyors to a cooling liquid, said flexible belt being sufficiently flexible and elastic that the portion thereof along said confronting runs bows down under the weight of cooling liquid on the upper surface of said portion, such that the upper surface of said flexible belt along said confronting runs comprises means for containing the cooling liquid so as to draw heat from the products to be frozen through said flexible belt.

4,555,915

DEFLECTABLE AIR BAFFLE ASSEMBLY FOR REFRIGERATOR

Marie E. Dasher, Knight Township, Vanderburgh County, Ind., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Nov. 30, 1984, Ser. No. 677,674
Int. Cl.[4] F25D *19/02*
U.S. Cl. 62—448 **15 Claims**

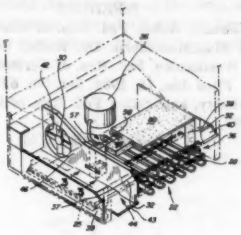
1. In a refrigeration apparatus having a thin wall, a baffle assembly resiliently mounted to said wall comprising:

edge means defining an opening in said wall,

a resiliently compressible baffle member defining a peripheral surface, a first portion of said peripheral surface contacting said wall adjacent said opening, and

a spring retainer means having a portion extending into said opening and engaging said wall for retaining said baffle member in contact with said wall,

said baffle member having a portion captively maintained between a portion of the retainer means and wall;



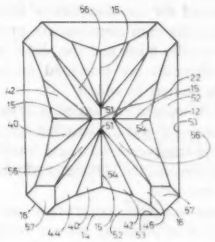
said retainer means acting in cooperation with the resilience of said baffle to keep said retainer means engaged with said wall and to keep said baffle member resiliently mounted to said wall.

4,555,916

STEP-CUT STONE WHICH HAS BEEN BRILLIANTIZED

Henry Grossbard, 552 Beach 132 St., Belle Harbor, N.Y. 11694

Filed Jul. 20, 1982, Ser. No. 400,088
Int. Cl.[4] A44C *17/00*
U.S. Cl. 63—32 **9 Claims**



1. A step cut diamond comprising: a straight-edged polygonal-shaped girdle having straight-edged corners connecting adjacent pairs of straight, mutually, perpendicular edges of said girdle; a crown having a table, a table break and a girdle break, said table break having triangular facets; and a pyramidal base having a girdle break, a culet, a culet break, kite-shaped facets extending from said culet toward the straight-edged corners of said girdle, four corner facets each having one edge coincident with the straight edge of a respective one of said straight-edged corners and a vertex abutting a vertex of the adjacent kite-shaped facet, shield-shaped facets which are part of the girdle break having bases on straight edges of the girdle and apices extending toward said culet, ridges extending along straight lines between said culet and the apices of said shield-shaped facets, and a fan of at least two pairs of halves symmetrically disposed about each ridge, the halves of the pair adjacent to the ridge being triangular facets, and the halves of the pair remote from said ridge being similar polygonal facets with at least four sides, said kite-shaped, corner and shield-shaped facets and said fans being symmetrically arranged about said culet, each of said corner facets having a side in common with one of said shield-shaped facets.

4,555,917

COMBINED KNITTING-TRANSFER CAM UNIT FOR V-BED FLAT KNITTING MACHINES WITH SLIDER NEEDLES

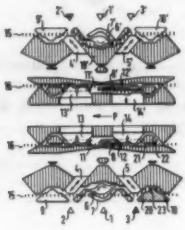
Gottfried Kühnert, Aalen, Fed. Rep. of Germany, assignor to Universal Maschinenfabrik Dr. Rudolf Schieber GmbH & Co., KG, Westhausen, Fed. Rep. of Germany

Filed Jun. 18, 1984, Ser. No. 621,771

Claims priority, application Fed. Rep. of Germany, Jul. 27, 1983, 3327093

Int. Cl.[4] D04B *15/36*

U.S. Cl. 66—78 4 Claims



1. A combined knitting-transfer cam unit for V-bed flat knitting machines, wherein needle butts of the needle bodies of slider needles are selectively lowerable in the needle channels of the needle beds by means of a needle selection device, wherein the slider needles have sliders provided with slider butts and arranged for the donation of stitches, wherein stationary and movable cam elements are provided for engagement with the needle butts and the slider butts, and wherein pressure cam elements are provided co-operating with the needle selection device, in which

(a) transfer cam units are arranged in advance of and following a knitting cam unit constructed symmetrically relative to its central transverse axis, said transfer cam units likewise being constructed symmetrically relative to the central transverse axis;

(b) the knitting cam unit comprises a cam element movable into operation in pendular manner relative to the central transverse axis at the positions of carriage reversal for engagement with the needle butts for the formation of stitches, and also comprises a cam element displaceable at the positions of carriage reversal along the cam unit relative to the central transverse axis for engagement with the slider butts for the formation of stitches;

(c) at each transition between knitting cam unit and transfer cam unit there is provided a cam element movable perpendicular to the plane of the cam unit for engagement with the slider butts for the donation of stitches and, at each same position, a cam element movable in the plane of the cam unit perpendicular to the direction of movement of the cam unit for engagement with the slider butts for the formation of stitches;

(d) in each transfer cam unit there is provided a stationary cam element for engagement with the slider butts for the donation of stitches and a cam element movable perpendicular to the plane of the cam unit for engagement with the needle butts for the acceptance of stitches; and

(e) on the central transverse axis of the knitting cam unit there is a selection position for the needle butts for the formation of tuck loops and, in advance of and following this position, respective selection positions for the needle butts for the formation of stitches or donation of stitches and for the acceptance of stitches.

4,555,918

UNITARY NEEDLE WITH OPENABLE EYE

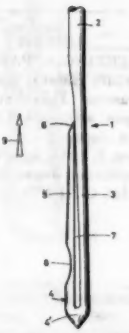
Georges J. J. Cahuzac, Le Bouscat, France, assignor to Societe Nationale Industrielle et Aerospatiale, Paris, France

Continuation-in-part of Ser. No. 228,925, Jan. 27, 1981, abandoned. This application Mar. 8, 1984, Ser. No. 587,402

Claims priority, application France, Aug. 11, 1980, 80 17665

Int. Cl.[4] D03B *35/02*

U.S. Cl. 66—119 5 Claims



1. A needle for interlacing reinforcing yarns, strands or flexible cords in a multi-directionally woven or knitted structure comprising a unitary shank, the terminal part of which is thinner than the remainder thereof, said terminal part having a flat surface on one side thereof, and being bent back on itself so that said flat surface forms a land face on the bent portion lying in opposition a land face on the unbent portion and defining therebetween an eye, the bent portion of said terminal part forming a straight flexible blade, the free end of which is normally biased into abutment with the flat land face of the unbent portion of the terminal part to normally maintain said eye closed the bent portion of said blade being reduced in thickness toward said free end forming an integral hinge facilitating elastic deformation on opening and closing of the eye for introduction and removal of yarn, strands or cords, and provide a straight smooth exterior surface in combination with the shank.

4,555,919

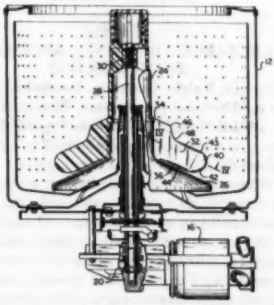
FLEXIBLE VANE AGITATOR FOR HIGH STROKE RATE AUTOMATIC WASHER

Robert A. Brenner, and Robert B. Sherer, both of St. Joseph Township, Berrien County, Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Oct. 22, 1984, Ser. No. 663,361

Int. Cl.[4] D06F *17/10*

U.S. Cl. 68—134 18 Claims



8. A vane configuration for use on a vertical axis washing machine agitator comprising:

a base end connected to said agitator;

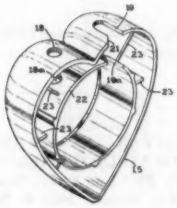
a radial tip at an opposite end of said vane; and
a thickness decreasing from said base end radially outwardly to a point more than half way along the length of said vane and an increasing thickness from said point radially outwardly to said tip, the thickness at said tip being greater than the thickness at any other point along said vane except at said base.

4,555,920

PADLOCK COVER

Judith A. Stanich, 1500 S. Ocean Dr., Apt. #1103, Pompano Beach, Fla. 33072

Continuation-in-part of Ser. No. 554,903, Nov. 25, 1983, Pat. No. 4,534,190. This application Jun. 8, 1984, Ser. No. 618,685
Int. Cl.⁴ E05B *67/38*
U.S. Cl. 70—54 **6 Claims**



1. For use on a padlock having a body with a lock mechanism therein and an inverted U-shaped shackle above said body with laterally spaced, opposite, straight legs, one of which is rotatably and slidably received in said body and the other of which is slidably reciprocable into and out of said body for locking engagement with said lock mechanism therein and removal from said body when released from locking engagement with said lock mechanism,
a cover for said padlock having:
a recess for receiving the padlock body;
a top opening above said recess on one side for rotatably and slidably receiving said one leg of the shackle, said cover surrounding said opening to prevent removal of the padlock from the cover except by sliding the shackle longitudinally through said opening in the cover;
and a slot above said recess opposite said top opening for passing said other leg of the shackle reciprocably into and out of said body of the padlock, said slot being open at one end to pass said other leg of the shackle when the shackle is rotated on said one leg after removal of said other leg from the body of the padlock.

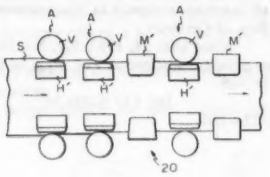
4,555,921

METHOD AND APPARATUS FOR CONTROLLING WIDTH AND THICKNESS OF STRIP

Yukio Matsuda; Kenzo Tachibana, both of Ibaraki, and Tsutomu Ueno, Chiba, all of Japan, assignors to Sumitomo Metal Industries, Ltd., Osaka, Japan

Division of Ser. No. 458,942, Jan. 18, 1983, abandoned. This application Jun. 28, 1984, Ser. No. 625,691
Claims priority, application Japan, Mar. 2, 1982, 57-32625; Apr. 22, 1982, 57-68008
Int. Cl.⁴ B21B *13/08*
U.S. Cl. 72—224 **4 Claims**

1. An apparatus for controlling width and thickness of a strip, the strip being hot-rolled and descaled and running in a line, comprising:
a rough control station for controlling dimensional accuracy of upper and lower surfaces of the strip, said rough control station including,
a first basic roll unit consisting of a pair of vertical rolls which contact side edges of the strip under pressure and two pairs of horizontal rolls which contact the upper and lower surfaces under pressure at a postion adjacent said vertical rolls contact with the strip, said horizontal rolls having a taper of predetermined shape on the roll surface toward the side edge of the strip, and
a pair of first masher rolls which contact the entire width of the strip downstream of said basic roll unit under pressure; and



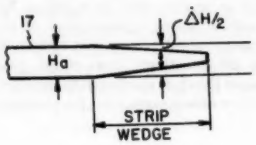
a fine control station for controlling the entire length of the strip on the downstream side of said rough control station, said fine control station including,
a plurality of sets of second basic roll units which are identical to the first basic roll unit, and
a plurality of pairs of second horizontal masher rolls which contact the upper and lower surfaces of the edge portions of the strip under pressure and have a taper inwardly toward the center line of the strip.

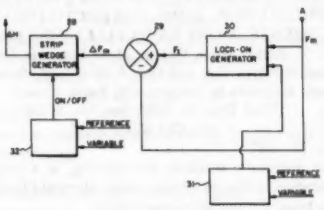
4,555,922

ADAPTIVE STRIP WEDGE CONTROL FOR REVERSING MILL

Vladimir B. Ginzburg, Pittsburgh, Pa., assignor to Tippins Machinery Company, Inc., Pittsburgh, Pa.

Filed Jul. 13, 1984, Ser. No. 630,518
Int. Cl.⁴ B21B *1/32, 37/08, 37/14*
U.S. Cl. 72—229 **12 Claims**





1. A process of rolling steel in a reversing mill comprising the steps for:
(a) passing the steel back and forth through the mill for a selected number of passes to achieve the desired thickness,
(b) on at least two early passes, each in a different direction, tapering the ends of the steel during taper passes by adjusting the roll gap, said roll gap adjustment (ΔH) being a function ($F(\Delta F_m)$) of the change in roll force (ΔF_m) above a lock-on force (F_1) for which the roll gap adjustment (ΔH) increases as the change in roll force (ΔF_m) increases

to effect a taper, said lock-on force and the beginning of tapering being dynamically established on the instant taper pass.

4,555,923

MOUNTING OF ROLLED STOCK GUIDING FACILITIES

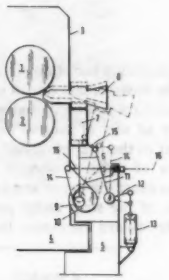
Erich Reth, and Wilhelm Hoenmanns, both of Duisburg, Fed. Rep. of Germany, assignors to Mannesmann AG, Duesseldorf, Fed. Rep. of Germany

Filed Dec. 21, 1983, Ser. No. 563,974

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1982, 3247485

Int. Cl.⁴ B21B *39/16*

U.S. Cl. 72—250 **2 Claims**



1. In a sizing mill having a stand with sizing rolls, the combination comprising a bottom support facility, the rolling stand being laterally slidably mounted in said bottom facility;

carrier means pivoted on said bottom facility and carrying rolling stock guidance means, the carrier provided for pivoting the guiding means toward and away from said rolls in said rolling stand;

means including a shaft journalled in said bottom facility serving as an eccentric pivot mount for said carrier for vertically adjusting a pivot point of the pivot mount of said carrier in relation to said bottom facility to thereby adjust the elevational level of the guiding means upon turning of the shaft in relation to the rolls in said stand; and

power drive means connected for turning the shaft.

4,555,924

AUTOMATIC MACHINE FOR CURVING, IN A SPATIAL CONFIGURATION, THIN AND RECTILINEAR METAL ELEMENTS, MORE ESPECIALLY METAL WIRES

Michel N. Remy, Raon l'Etape; Jean-Francois Delaite, Saint Michel sur Meurthe, and Guy J. Woirgard, Baccarat, all of France, assignors to Autocoussin, Paris, France

Filed Dec. 16, 1983, Ser. No. 562,474

Int. Cl.⁴ B21D *7/02*

U.S. Cl. 72—307 **16 Claims**

9. An automatic machine for curving, in a predetermined configuration, a thin rectilinear metal element (**1**) such as wire, strip or tube, the machine comprising:

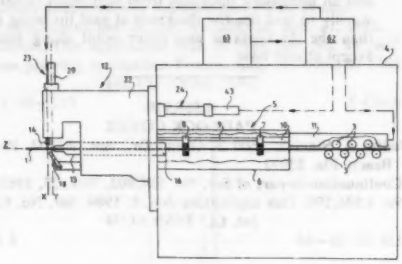
feed means (**5**), including an outlet, for moving such metal element (**1**) through the outlet with a stepped feed movement in a feed direction;

bending means (**14**) mounted for rotation downstream from and near the feed-means outlet;

a first drive mechanism (**24**) for rotating the bending means about a first axis (Y) that is perpendicular to the feed direction;

a second drive mechanism (**23**) for reciprocating the bending means along a rectilinear path (X) that is parallel to the first axis (Y); and

a third drive mechanism (**49**) for rotating the bending means (**14**), relative to such metal element (**1**), about a second axis (Z) that is parallel to the feed direction;



the operation of the first, second and third drive mechanisms (**24, 23**) being synchronized with that of the feed device (**5**).

4,555,925

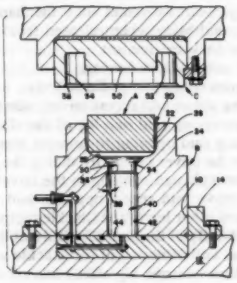
METHOD AND APPARATUS FOR PREFORMING A BILLET WITH NO DRAFT AND NO FLASH

Ralph D. Delio, R.D. #1 Susan Trace, New Wilmington, Pa. 16142, and Donald J. Diemer, 3665 E. 78th St., Cleveland, Ohio 44105

Continuation-in-part of Ser. No. 500,886, Jun. 3, 1983, which is a continuation-in-part of Ser. No. 2,851, Jan. 12, 1979, Pat. No. 4,294,101. This application Jun. 11, 1984, Ser. No. 619,121

Int. Cl.⁴ B21D *22/00*

U.S. Cl. 72—359 **17 Claims**



1. A method of forming a billet without draft and without flash, the method comprising:

(a) heating a billet, which billet defines at least a first cross section;

(b) positioning a lower closed die to receive the heated billet which lower die defines:

(i) a billet receiving region having a transverse billet receiving region cross section,

(ii) a throat region adjacent the billet receiving region, the throat region having a transverse throat cross section which is smaller than the transverse billet receiving region cross section and smaller than the billet first cross section, and,

(iii) an enlarged relief region disposed adjacent the throat region and having a transverse relief region cross section which is larger than the transverse throat cross section and having a relief region longitudinal length;

(c) positioning the heated billet in the lower die billlet receiving region with the billet first cross section oriented transversely;

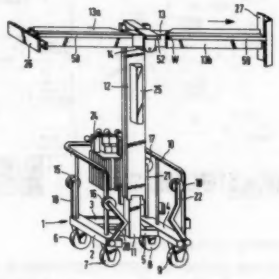
(d) forcing the billet partially through the throat region; and,

(e) removing the billet from the lower die.

4,555,926
EQUIPMENT FOR THE REPAIR OF, IN PARTICULAR FOR CORRECTING DENTS OR BULGES IN, CONTAINERS

Ruedi Bieli-Möschlin, Hauptstrasse 46, CH-4107 Ettingen, and Alois Hurschler-Flury, Rütiweg 357, CH-4245 Kleinlützel, both of Switzerland

Filed Jan. 16, 1984, Ser. No. 571,246
Claims priority, application Switzerland, Jan. 21, 1983, 436/83
Int. Cl.⁴ B21D *1/08*
U.S. Cl. 72—392 **12 Claims**



1. Equipment for the repair of dents or bulges in containers, comprising:

wheel supported frame means;

a vertically upright support column fixedly mounted on said frame means;

first carriage means reciprocally mounted on said support column between upper and lower limits;

elongated beam means and first mounting means for mounting said beam means on said first carriage means, said mounting means including means defining a horizontal axis intermediate the ends of said beam means;

second and third carriage means reciprocally mounted on said beam means, one each on opposite sides of said horizontal axis, each said second and third carriage means having a container engaging tool thereon;

drive means for driving said second and third carriage means reciprocally on said beam means;

a cylinder means having a movable member thereon and second mounting means for mounting said cylinder means to said support column;

connecting means for connecting said movable member on said cylinder means to said first carriage means so that said first carriage means will travel up and down said support column in response to a movement of said movable member;

whereby said second and third carriage means and said tool thereon can be moved by said drive means into simultaneous engagement with spaced surface sections on said container, such as spaced sidewall sections or spaced top and bottom wall sections at vertical locations determined by the position of said first carriage means on said support column.

4,555,927
APPARATUS FOR STRAIGHTENING VEHICLE STRUCTURAL PART

William G. Grace, 6263 Staheli Dr., Kelseyville, Calif. 95451

Filed Apr. 11, 1984, Ser. No. 598,773
Int. Cl.⁴ B21D *1/14*
U.S. Cl. 72—447 **10 Claims**

1. Apparatus for straightening a structural part comprising:

a table having an upper surface means for supporting a structural part to be straightened;

means on the table for releasably mounting a structural part to be straightened;

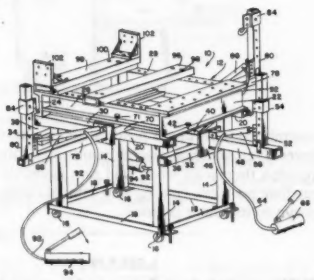
a first central bar shiftably mounted on the table for movement in a first plane into in any one of a number of fixed, operative positions;

means releasably securing the first central bar in a fixed, operative position;

a second central bar shiftably mounted on the table for movement in a second plane and transverse to the first central bar into any one of a number of fixed, operative locations;

means releasably securing the second central bar in a fixed, operative location;

an actuatable power device for each central bar, respectively; and



means attaching each power device on an outer end of the respective central bar, said attaching means having a post extending laterally from the plane of the respective central bar, and normally extending upwardly from the plane of said upper surface means of the table, each post having an attachment bracket shiftably mounted thereon for movement from a position substantially horizontally aligned with said upper surface means to a position above the plane of said upper surface means, whereby an elongated member can be coupled to the attachment means of each post and to a structural part mounted on the table for exerting a straightening force in any one of a number of different directions on the structural part itself when the respective power device is actuated.

4,555,928
PRESS HAVING A LEVERAGED LINKAGE ASSEMBLY MECHANISM

David M. Hansen, Doylestown, Pa., assignor to Penn Engineering & Manufacturing Corp., Danboro, Pa.

Filed Apr. 27, 1983, Ser. No. 489,032
Int. Cl.⁴ B21J *9/18*
U.S. Cl. 72—451 **4 Claims**

1. A press for assembling a fastener or the like to a plate, or the like, comprising:

a frame,

an anvil assembly carried by said frame,

a ram assembly movable between upper, intermediate and lower positions,

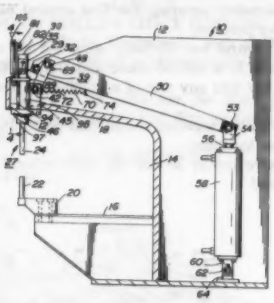
first actuating means for moving said ram assembly back and forth between said upper, intermediate and lower positions,

a single lever having a first portion and a second pressure applying portion movable out of the path of movement of said ram assembly when said ram assembly is in its upper position and movable over said ram assembly when said ram assembly is in its intermediate position and in its lower position,

an upper pin mounted on said single lever intermediate said first and second portions of said single lever for pivotally

mounting said single lever to said frame and for providing a fulcrum for said single lever,

second actuating means for moving said single lever out of the path of movement of said ram assembly when said ram



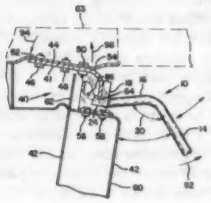
assembly is in its upper position and for moving said single lever over said ram assembly and into force transmitting relation therewith when said ram assembly is in its intermediate position, causing said ram assembly for forcefully move to its lower position.

4,555,929

DOOR HINGE ALIGNING TOOL AND METHOD

Gerald McBee, 793 W. Tamarack, Hermiston, Oreg. 97838

Filed Jul. 25, 1983, Ser. No. 512,792
Int. Cl.⁴ B21J *13/08*
U.S. Cl. 72—458 **3 Claims**



1. A method of aligning a sprung vehicle door frame and hinge assembly including a hinge mount connected to the frame without removing the door and its hinge from the vehicle door frame, the hinge mount having a flange portion of a fixed width, the method comprising:

opening the vehicle door;

providing a prying tool having an elongated handle and J-shaped head means mounted on an end of the handle defining a channel for engaging an exposed margin of the flange portion of said hinge mount contiguously along most of the width of the flange portion for prying the hinge mount without deforming the engaged flange portion;

sizing an end of the head member remote from the handle to fit between the flange portion of the hinge mount and an adjacent periphery of the door;

positioning the prying tool between the door and door frame including inserting said end of the head member between the flange portion and the adjacent door periphery;

engaging the margin of the flange portion of said hinge mount in the channel of the head means; and

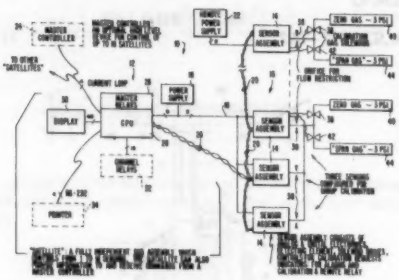
rotating the tool about the hinge in a direction of closure of the door to pry the hinge mount so as to bend said door frame to a predetermined alignment position without deforming the flange portion.

4,555,930

DIGITAL GAS SENSING SYSTEM

Thomas W. Leach, Waldwick, and James Schaeffer, North Caldwell, both of N.J., assignors to Control Instruments Corp., Fairfield, N.J.

Filed Feb. 14, 1984, Ser. No. 580,028
Int. Cl.⁴ G01N *31/00*
U.S. Cl. 73—23 **11 Claims**



1. A gas sensing system comprising:

a satellite means including a central processing unit (CPU) means for controlling said system and for transmitting information in a digital code having a predetermined number of bits;

a single pair of information leads;

sensor means attached to said satellite means by said single pair of information leads;

a source of zero calibration gas;

a source of span gas;

valve means for applying said zero calibration gas and said span gas to said sensor means;

a master controller means for controlling a plurality of satellite means;

a parity determining means within said sensor means for generating a digital word in response to interrogation from said satellite means which differs by one parity bit from the digital word generated by said satellite means so that said satellite means can recognize that it is getting a response from the addressed sensor means and so that the non-addressed sensor means recognizes that the digital word is not coming from said satellite means;

a sensor universal receiver/transmitter means (UART) for sending and receiving signals to and from said satellite means and for generating a parity error bit signal and a data ready bit signal;

an address selection means for generating a digital address for a given sensor means different from the digital address of other sensor means associated with a given satellite means;

comparator means for comparing the address of an incoming digital signal with the address selected by the address selection means and for producing an output if the address of the incoming digital signal is the same as the address selected by the address selection means; and,

gate means for producing an output in response to an input from said comparator means and the presence of a parity error bit signal and a data ready bit signal from said sensor UART,

wherein said satellite means communicates to said sensor means and said sensor means communicates with said satellite means exclusively on said single pair of information leads and wherein the application of said zero calibration gas sets a zero point for said sensor means and application of said span gas sets an intermediate range point for said sensor means whereby said CPU takes both said zero point and said intermediate range point and extrapolates

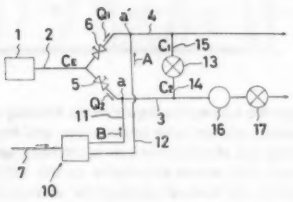
the actual value of subsequent gas measurements from said two points.

4,555,931

APPARATUS FOR MEASURING OR CONTROLLING THE SEPARATION RATIO OF GAS

Hiroyuki Amimoto, and Hiroji Kohsaka, both of Kyoto, Japan, assignors to Horiba, Ltd., Kyoto, Japan

Filed Apr. 1, 1983, Ser. No. 482,313
Claims priority, application Japan, Apr. 21, 1982, 57-66496
Int. Cl.⁴ G01N *31/00*
U.S. Cl. 73—23 **2 Claims**



1. An apparatus for indirectly measuring the separation ratio of a first gas containing a specified gas whose path is branched into at least two branches, said separation ratio being defined as the ratio of the gas flow rate in one of said at least two branches divided by the gas flow rate in another of said at least two branches, and said apparatus comprising:

a mixture gas supply means for respectively supplying a mixture gas with a known and adjustable flow rate and separation ratio to each of said at least two branches, said separation ratio being defined as the ratio of the gas flow rate in one of said at least two branches divided by the gas flow rate in another of said two branches, and;

a gas concentration detector means operatively connected to said at least two branches downstream of said mixture gas supply means for measuring the difference in concentration of said specified gas in said at least two branches;

wherein, when said mixture supply means is adjusted so that said detector means measures a zero difference in concentration in said at least two branches, then said separation ratio of said first gas corresponds to said separation ratio of said mixture gas from said mixture gas supply means.

4,555,932

METHOD AND APPARATUS FOR ASSAYING THE PURITY OF A GAS

Edward L. Crosby, Jr., West Melbourne, Fla., assignor to RCA Corporation, Princeton, N.J.

Filed Feb. 3, 1984, Ser. No. 576,913
Int. Cl.⁴ G01N *29/02*
U.S. Cl. 73—24 **13 Claims**

1. A method of assaying the purity of a gas containing an unknown amount of contaminants comprising:

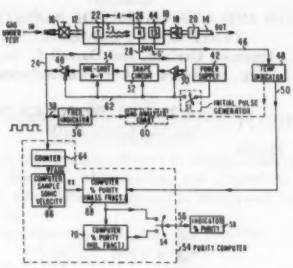
propagating a sonic signal in the gas from a first point to a second point spaced a given distance from the first point, said signal having a repetition rate in a range of frequencies which is a function of the gas purity;

sensing the temperature of said gas;

determining the repetition rate of said signal at the second point;

determining from said determined repetition rate and said given distance the velocity of the signal propagating between said two points; and

deriving the purity of said gas from said determined velocity and said sensed temperature, said deriving step including computing the mass fraction of the gas-contaminant mixture (P_{MG}) where:



$$P_{MG} = \frac{V_x - V_{CA}}{V_{CG} - V_{CA}}$$

and where V_x is said determined signal velocity computed from the determined frequency, and V_{CG} represents the sonic velocity in the gas such that:

$$V_{CG} = V_{OG} + (K_G \cdot T_x)$$

where VOG is the sonic velocity in the gas at 0° C. and K_G is the temperature coefficient of sonic velocity in the gas and T_x is the sensed temperature, and, V_{CA} represents the sonic velocity in an air such that:

$$V_{CA} = V_{OA} + (K_A \cdot T_x)$$

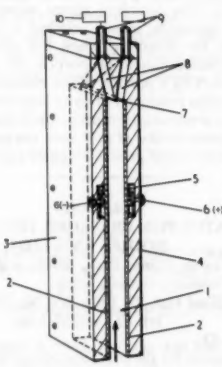
where V_{OA} is the sonic velocity in air at 0° C. and K_A is the sonic velocity temperature coefficient for air.

4,555,933

DUST ASSESSMENT APPARATUS AND METHOD

Arthur M. Johnston, Roslin, Scotland, assignor to Coal Industry (Patents) Limited, London, England

Filed Feb. 8, 1984, Ser. No. 577,955
Claims priority, application United Kingdom, Feb. 18, 1983, 8304549
Int. Cl.⁴ G01N *15/02, 27/60*
U.S. Cl. 73—28 **7 Claims**



5. A method of assessing the magnitude of charge and polarity of electrostatically charged dust particles suspended in a gas, comprising the application of different states of electrical charge to opposite walls of electrically conductive material and located in a gas flow conduit, flowing the gas through the conduit dividing the gas flow downstream of the charged

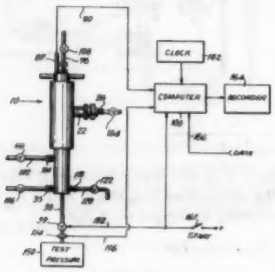
opposite walls and assessing the dust distribution in each fraction of the divided gas flow.

4,555,934

METHOD AND APPARATUS FOR NONSTEADY STATE TESTING OF PERMEABILITY

David L. Freeman, Garland, and Darrell C. Bush, Colleyville, both of Tex., assignors to Core Laboratories, Inc., Dallas, Tex.

Filed Sep. 29, 1982, Ser. No. 426,798
Int. Cl.[4] G01N *15/08*
U.S. Cl. 73—38 **20 Claims**



18. Apparatus for use in measuring the permeability of a core sample, comprising a core sample holder having an internal chamber for containing said core sample; a source of constant, predetermined confining pressure; means for supplying said confining pressure to said internal chamber; a source of predetermined test pressure substantially less than said confining pressure; a first channel communicating between said source of test pressure and said internal chamber for supplying said test pressure to an upstream end of said core sample; a second channel communicating with a downstream end of said core sample in said internal chamber and comprising at least a portion of a fixed closed volume; pressure transducer means disposed in said closed volume for producing electrical pressure signals representing the downstream pressure of said core sample; time sampling means for producing time samples, representing the passage of time; valve means coupled between said source of test pressure and said first channel and operative to apply said test pressure to said first channel; means for initiating said time sampling means when said valve means commences operation; means coupled to said pressure transducer means for detecting when the downstream pressure reaches a predetermined proportion of said test pressure; means for selecting a portion of the electrical pressure signals and time samples produced prior to said downstream pressure reaching said predetermined proportion; and means for determining the permeability of said core samples as a function of said selected electrical pressure signals and time samples.

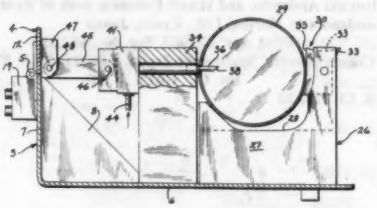
4,555,935

APPARATUS FOR PRESSURE TESTING OF CAN BODIES AND LIDS

Karl Elert, Grosse Pointe Park, Mich., assignor to The Stroh Brewery Company, Detroit, Mich.

Filed Oct. 27, 1983, Ser. No. 546,168
Int. Cl.[4] G01M *3/02*
U.S. Cl. 73—52 **15 Claims**

9. An apparatus for the pressure testing of empty can bodies, comprising a housing having an open side, a cover to enclose said open side and movable between an open position and a closed position, support means disposed within the housing to support a closed empty can body to be tested, a can penetrating member disposed within the housing and adapted to penetrate the wall of a can body supported on said support means, means for mounting said can penetrating member for movement between an inoperative position and an operative position wherein said can penetrating member penetrates the wall of the can body, actuating means operably connected to the can penetrating member and responsive to the cover being moved toward the closed position for moving said penetrating member from the inoperative position to the operative position,



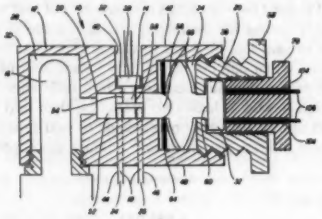
locking means for locking the cover to the housing and having a locked position and an unlocked position, gas supply means for introducing gas through the can penetrating member into said can body, and means responsive to the locking means being moved to the locked position for activating said gas supply means.

4,555,936

MULTIFUNCTIONAL DETECTOR

Raymond P. W. Scott, Wilton, Conn., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Continuation-in-part of Ser. No. 555,182, Nov. 23, 1983. This application Dec. 13, 1984, Ser. No. 685,009
Int. Cl.[4] G01N *31/08*
U.S. Cl. 73—61.1 C **16 Claims**



1. A detector for determining a plurality of characteristics of a liquid sample, the detector comprising, in combination:

a housing block;

an elongated sample cell with a central bore disposed along an axis and positioned within said block through which a liquid can flow, said cell having two opposite ends;

means for determining the electrical conductivity of a liquid within said cell, said conductivity determining means including electrodes disposed adjacent said opposite ends of said elongated sample cell;

a source of radiation disposal within said block at one end of said cell for directing radiation through the liquid in said cell in a direction generally parallel said axis;

a radiation sensor disposed within said block at the opposite end of said cell for detecting the level of the radiation from said source after passing through the liquid in said cell;

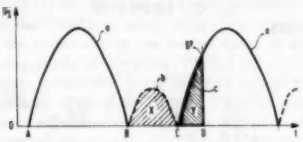
a fluorescence sensor means disposed in said block so that fluorescence radiation from the liquid in said sample cell impinges thereon but radiation from said radiation source does not impinge thereon.

4,555,937

METHOD FOR MEASURING THE FLOW RATE OF PULSATING MEDIUM HAVING A BACKFLOW

Jaihind S. Sumal, Vaihingen-Ensingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Apr. 11, 1983, Ser. No. 483,992
Claims priority, application Fed. Rep. of Germany, Aug. 19, 1982, 3230829
Int. Cl.[4] G01M *15/00*
U.S. Cl. 73—118 2 Claims



1. In a method for measuring the flow of a pulsating medium having a backflow aspirated by an internal combustion engine in a flow cross section of an air intake tube by means of a flow rate measuring device which determines the relationship between a flow rate value Q of the medium and a flow rate measurement value U_S of said measuring device, and for correcting the flow rate measuremeant value U_S due to backflow, comprising the improved steps of,

regulating said flow rate measurement value U_S to a given value at the onset of a backflow of said pulsating medium,

integrating said measurement value in one direction during said backflow to a final value occurring at the end of said backflow,

integrating in an opposite direction from said final value said measurement value to said given value, and

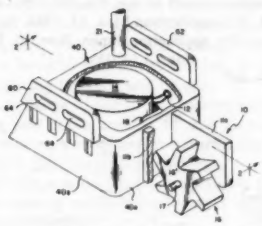
deregulating said measurement value at the end of said opposite direction integrating step to said given value.

4,555,938

MARINE INSTRUMENT

Stephen G. Boucher, Amherst, and Robert K. Jeffers, Concord, both of N.H., assignors to Airmar Technology Corporation, Amherst, N.H.

Filed Jun. 1, 1984, Ser. No. 616,289
Int. Cl.[4] G01C *21/10*
U.S. Cl. 73—187 18 Claims



1. A marine transducer device for mounting to the exterior transom of marine vessels comprising:

(a) a housing having a top wall and enclosing side walls in which an electromagnetic sensor is mounted;

(b) a pair of support members externally attached to said housing and extending laterally therefrom;

(c) a paddlewheel rotatably mounted in a vertically unenclosed partially submerged position between said support members for generating a patterned electromagnetic field which extends from the paddlewheel to the sensor;

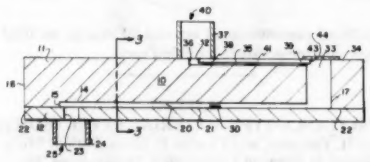
(d) lead wires coupled to said sensor for coupling electrical signals generated by said sensor, as said paddlewheel rotates, to display devices on said marine vessel.

4,555,939

CONDITION RESPONSIVE SENSOR FOR FLUID FLOW MEASUREMENT

Philip J. Bohrer, Minneapolis; Robert E. Higashi, Bloomington; Timothy L. Johnson, Minnetonka, and Ernest A. Satren, Bloomington, all of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Mar. 19, 1984, Ser. No. 590,673
Int. Cl.[4] G01F *15/14*
U.S. Cl. 73—198 9 Claims



1. A condition responsive sensor adapted to be connected across a source of fluid pressure differential, including: base means having first port means; said base means supporting flow sensor means; body means including a first side adjacent said base means and a second side remote from said base means; said body means further having reentrant flow channel means connected between said first and second sides of said body means; said base means and said body means forming flow sensor channel means connecting said first port means to said reentrant flow channel means to cause any fluid flow in said condition responsive sensor to pass over said flow sensor means; capillary tube restriction means placed on said second side of said body means with a first end of said capillary tube restriction means sealed in a fluid tight relationship to said reentrant flow channel means; said capillary tube restriction means located on said second side of said body means adjacent to and generally parallel to said flow sensor channel means so that a total length of said condition responsive sensor is minimized; and a second end of said capillary tube restriction means sealed at second port means to form a complete fluid flow passage through said condition responsive sensor.

4,555,940

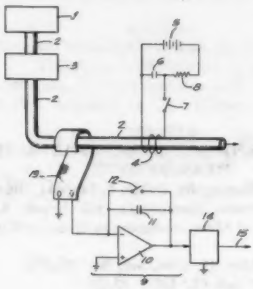
METHOD AND APPARATUS FOR MEASURING FLUID FLOW RATES AND VOLUMES THROUGH FLUID FLOW PATHS

Herman L. Renger, 2790 Stokes Canyon Rd., Calabasas, Calif. 91302

Filed Nov. 1, 1982, Ser. No. 438,356
Int. Cl.[4] G01F *1/68*
U.S. Cl. 73—204 17 Claims

1. A system for measuring and for monitoring fluid flow in a fluid flow path comprising means for intermittently modifying the temperature of part of said fluid flow path by utilizing a predetermined amount of energy and means including pyroelectrically-sensitive detector means for measuring and for

monitoring changes in temperature in said temperature-modified part of said fluid flow path and said fluid in response to said utilized predetermined amount of energy as fluid flows through said temperature-modified part.

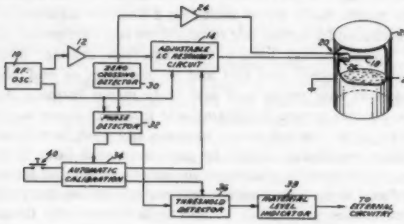


4,555,941

CAPACITANCE-TYPE MATERIAL LEVEL INDICATOR

George H. Fathauer, and Charles F. Hood, both of Mesa, Ariz., assignors to Berwind Corporation, Philadelphia, Pa.

Continuation of Ser. No. 411,527, Aug. 25, 1982, Pat. No. 4,499,766. This application Sep. 21, 1984, Ser. No. 652,854
Int. Cl.[4] G01F *23/26;* G01R *27/26*
U.S. Cl. 73—304 C 8 Claims



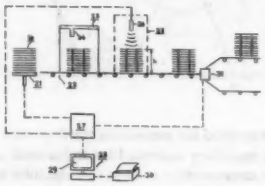
1. A system for indicating the level of material in a vessel as a function of material capacitance comprising a capacitance probe adapted to be disposed in a vessel so as to be responsive to variations in capacitance as a function of material level in said vessel, oscillator means for providing a periodic electrical signal, circuit means for coupling said periodic electrical signal to said capacitance probe such that operating characteristics of said circuit means responsive to said electrical signal vary as a function of capacitance at said probe, said circuit means including variable second capacitance means separate from said probe and connected in said circuit means such that said operating characteristics of said circuit means responsive to said electrical signal vary independently as functions of capacitance at said probe and at said second capacitance means, calibrating means including means for initiating a calibration operation, means for automatically varying said second capacitance means in a predetermined manner independently of said probe during said calibration operation and means responsive to operating characteristics of said circuit means during said calibration operation as a combined function of said electrical signal and said varying second capacitance means for terminating said calibration operation and variation of said second capacitance means when said circuit means obtains a predetermined operating characteristic, and means responsive to variations in operating characteristics of said circuit means from said predetermined operating characteristic for indicating material level in said vessel as a function of capacitance at said probe.

4,555,942

METHOD FOR CONTINUALLY CONTROLLING THE QUALITY OF CATHODE COPPER

Björn M. Ludvigsson, Örviken, Sweden, assignor to Boliden Aktiebolag, Stockholm, Sweden

Continuation of Ser. No. 547,357, Oct. 31, 1983, abandoned. This application Mar. 27, 1985, Ser. No. 716,599
Claims priority, application Sweden, Nov. 10, 1982, 8206396
Int. Cl.[4] G01N *9/02*
U.S. Cl. 73—433 8 Claims



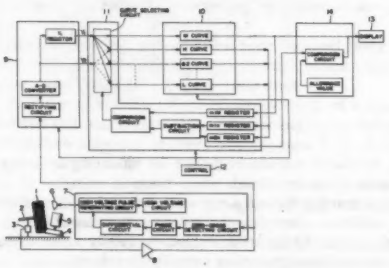
1. A method for monitoring the quality of electrolytically produced copper cathodes affected by impurity content and surface structure without taking any copper sample, said method comprising: stacking copper cathodes to form a stacked bundle, ascertaining values related to the mass and stacked volume of said bundle for determining a value of bulk density of said bundle, or for determining a value derived from said bulk density, making a comparison of said determined value with predetermined known values, and determining the quality of said stacked copper cathode bundle from said comparison, whereby a determination as to whether the quality of said electrolytically produced copper cathodes in said copper cathode bundle meets a predetermined standard of quality may be made.

4,555,943

METHOD OF AND APPARATUS FOR MEASURING AN UNBALANCE VALUE OF A WHEEL MOUNTED ON A BODY OF AN AUTOMOBILE

Tsuyoshi Ohta, Urawa, and Koji Uritani, Ohi, both of Japan, assignors to Riken Keiki Kabushiki Kaisha, Tokyo and Nitto Kabushiki Kaisha, Osaka, both of, Japan

Continuation-in-part of Ser. No. 309,939, Oct. 9, 1981, abandoned. This application Mar. 12, 1984, Ser. No. 588,296
Claims priority, application Japan, Nov. 19, 1980, 55-161904
Int. Cl.[4] G01M *1/22*
U.S. Cl. 73—457 3 Claims



1. A method of measuring an unbalance value of a wheel comprising the steps of preliminarily determining and storing in a memory (10) a plurality of curves (M, H, #2, #3, #4 . . . L) showing the relationship between the measured magnitude

of vibration of a rotating wheel and the actual value of the unbalance according to the type of wheel or automobile on which the wheel is mounted; measuring by means of a sensing device (3) and converter circuit (9) a first magnitude of vibration (Y1) of a given wheel while it is rotated; obtaining a first value of unbalance (m1M) corresponding to said first magnitude of vibration (Y1) by using the curve (M) in said memory (10) which has the smallest value of unbalance for said first magnitude of vibration (Y1); placing a counter-weight corresponding to said first value of unbalance (m1M) on the given wheel and employing said sensing device (3) and said converter circuit (9) for obtaining a second magnitude of vibration (Y2) when the wheel is rotating; using a selector circuit (11) for selecting the curve having the largest value of unbalance for said first magnitude of vibration (Y1) but for which the difference between unbalances corresponding to said first and second magnitudes of vibration (Y1 and Y2) does not exceed said first value of unbalance (m1M); and using said selected curve and the second magnitude of vibration (Y2) to determine a second value of unbalance (m2M).

4,555,944

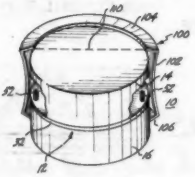
METHOD AND APPARATUS FOR PRODUCING A CONTROLLED PRELOAD ON A TRANSDUCER ASSEMBLY

Richard A. Hanson, Woodinville, and Steven A. Foote, Redmond, both of Wash., assignors to Sundstrand Data Control, Inc., Redmond, Wash.

Filed May 1, 1984, Ser. No. 605,885

Int. Cl.⁴ B23P *15/13*; G01P *11/02*

U.S. Cl. 73—517 B **32 Claims**



1. A method for producing a controlled preload between the first and second mating sections of a transducer assembly, the method comprising the steps of:

(a) providing a sleeve member, said sleeve member having a side portion with predeterminedly spaced apart upper and lower flanges projecting therefrom, each flange configured to be joined with one of said mating sections;

(b) applying a force to said sleeve member to thereby increase the spacing between said flanges;

(c) joining each flange to one of said mating sections; and

(d) removing said force applied to said sleeve member thereby producing a compression force tending to restore said flanges to their prestressed spacing,

whereby said compression force is transmitted to said first and second mating sections producing a predetermined preload therebetween.

4,555,945

METHOD AND APPARATUS FOR PRODUCING A CONTROLLED PRELOAD ON A TRANSDUCER ASSEMBLY BY MEANS OF A COMPOSITE MATERIAL SLEEVE

Richard A. Hanson, Woodinville, Wash., assignor to Sundstrand Data Control, Inc., Redmond, Wash.

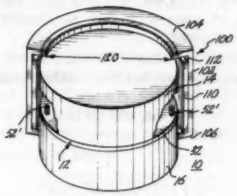
Filed May 1, 1984, Ser. No. 605,867

Int. Cl.⁴ B23P *15/13*; G01P *11/02*

U.S. Cl. 73—517 B **35 Claims**

1. A method for producing a controlled preload between the first and second mating sections of a transducer assembly, the method comprising the steps of:

(a) providing a sleeve member, said sleeve member having a side portion with predeterminedly spaced apart upper and lower flanges projecting therefrom, each flange configured to be joined with one of said mating sections, said side portion being formed of a first material having a first coefficient of thermal expansion, said sleeve member further including an inner sleeve element disposed intermediate said flanges and having a predetermined spacing with respect to said flanges, said inner sleeve element being formed of a second material having a second coefficient of thermal expansion;



(b) controlling the temperature of said sleeve member such that said inner sleeve element exerts a tensile stress on said flanges increasing the spacing therebetween;

(c) joining each flange to one of said first and second mating sections; and

(d) controlling the temperature of said sleeve member such that said tensile stress on said flanges is reduced thereby producing a compression force on said flanges tending to reduce the spacing therebetween, said compression force being transmitted to said first and second mating sections to produce a predetermined compressive preload therebetween.

4,555,946

ACCELEROMETER

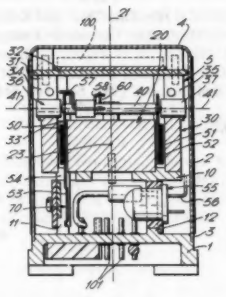
Nicholas R. Capaldi, and Brian W. Griffin, both of Cheltenham, England, assignors to Smiths Industries Public Limited Company, London, England

Filed Feb. 15, 1984, Ser. No. 580,302

Claims priority, application United Kingdom, Feb. 25, 1983, 8305252

Int. Cl.⁴ G01P *15/13*

U.S. Cl. 73—517 B **10 Claims**



1. An accelerometer comprising: a magnet of cylindrical shape; an elongate tubular coil; means mounting said coil to surround said magnet coaxially along a first axis, said magnet being polarized along a second axis transverse of the first axis, and said means mounting said coil being operative to permit

angular displacement of said coil about a third axis which is orthogonal with each of said first and second axes and displaced above said second axis and above one end of said coil, such that a component of acceleration along said second axis produced angular displacement of said coil about said third axis which can be restored to a datum position by energizing said coil.

4,555,947

METHOD AND APPARATUS FOR THE MEASUREMENT OF FLUID FLOW VELOCITIES

Pieter Van Prooijen, Nieuw-Lekkerland, Netherlands, assignor to IHC Holland N.V., Papendrecht, Netherlands

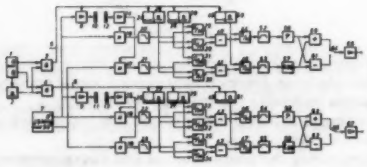
PCT No. PCT/NL83/00020, § 371 Date Jan. 17, 1984, § 102(e) Date Jan. 17, 1984, PCT Pub. No. WO83/04106, PCT Pub. Date Nov. 24, 1983

PCT Filed May 19, 1983, Ser. No. 577,624

Claims priority, application Netherlands, May 19, 1982, 8202079

Int. Cl.⁴ G01F *1/70*

U.S. Cl. 73—861.06 **16 Claims**



1. In a method for the measurement of fluid flow velocities, in which at least two transmitter transducers, situated at a predetermined mutual distance seen in the flow direction of the fluid, transmit to at least two receiver transducers, also situated at a predetermined mutual distance seen in the flow direction of the fluid, in which each receiver transducer receives mainly the signal from an associated transmitting transducer and in which the signals supplied by the receiver transducers are correlated, in order to determine the fluid flow velocity; the improvement comprising transmitting from the transmitter transducers pulse-shaped signals having such mutual time separation, that reflections caused by standing waves nearly completely fade out within this time separation.

4,555,948

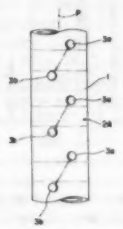
METHOD OF ULTRASONIC FLAW DETECTION OF PIPE

Hirofumi Miyamoto, Hirakata; Nobuaki Kaitatsu, Ikoma; Junichi Sugitani, Hirakata; Yasumaru Taniguchi, Osaka, and Tetsuo Kaji, Himeji, all of Japan, assignors to Kubota, Ltd. and Osaka Gas Company, Limited, both of Osaka, Japan

Filed Oct. 14, 1983, Ser. No. 541,856

Int. Cl.⁴ G01N *29/04*

U.S. Cl. 73—640 **7 Claims**



1. A method of ultrasonic flaw detection of a pipe with a test piece part therein by means of ultrasonic waves applied onto the pipe, comprising:

measuring decibel values T(dB) of ultrasonic waves around the entire periphery of the pipe at one side adjacent to the test piece part,

measuring decibel values B(dB) of ultrasonic waves around the entire periphery of the pipe at the other side adjacent to the test piece part,

measuring decibel values W(dB) of ultrasonic waves passing through the test piece part around the entire periphery of the pipe,

establishing the arithmetic mean of the decibel values T(dB) and B(dB) as a function of position around the pipe by following equation (1):

$$Xn = \frac{Tn(\mathrm{dB}) + Bn(\mathrm{dB})}{2} - K \qquad (1)$$

wherein n is a position around the pipe, and K is a constant, and

deriving the difference between the arithmetic mean obtained by the equation (1) and the decibel value W(dB) at the test piece part around the periphery of the pipe, the difference being measured around the entire periphery of the pipe to determine flaw developing tendencies in the test piece part on the basis of variations of the difference.

4,555,949

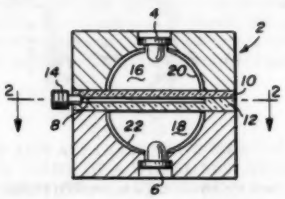
OPTICAL FLUID PRESSURE SENSOR

Hal C. Danby, Palo Alto, and Carl Ritson, San Jose, both of Calif., assignors to Anatros Corporation, San Jose, Calif.

Filed May 4, 1984, Ser. No. 607,080

Int. Cl.⁴ G01L *7/00*

U.S. Cl. 73—705 **10 Claims**



1. An optical fluid pressure sensor comprising a light source, a light detector positioned in the path of light from the light source, and a transparent capillary passageway means containing a gas and positioned in the light path from the light source to the light detector, the capillary passageway means having an inlet end means for receiving liquid from an external source under fluid pressure to be monitored and an outlet end, the outlet end thereof having a closure means for preventing escape of gas therefrom.

4,555,950

REFRACTIVE OPTICAL FLUID PRESSURE SENSOR

Hal C. Danby, Palo Alto, and Carl Ritson, San Jose, both of Calif., assignors to Anatros Corporation, San Jose, Calif.

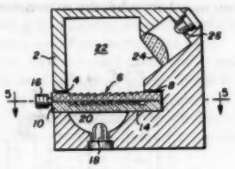
Filed Jun. 27, 1984, Ser. No. 625,161

Int. Cl.⁴ G01L *7/00*

U.S. Cl. 73—705 **9 Claims**

1. An optical fluid pressure sensor comprising a light source, a capillary passageway containing a gas and formed in a transparent solid, the capillary passageway having a refractive surface positioned in the light path of light from the light source, the angle between the normal to the refractive surface and the light path being less than the Critical Angle of the transparent solid, and a light detector positioned in the path of refracted light when the refractive surface is a solid-to-gas

interface and outside the path of refracted light when the refractive surface is a solid-to-liquid interface, the capillary passageway having an inlet end means for receiving liquid



from an external source under fluid pressure to be monitored and an outlet end, the outlet end thereof having a closure means for preventing escape of gas therefrom.

4,555,951

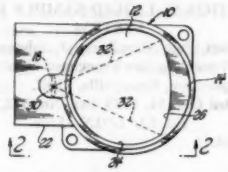
REFLECTIVE ACOUSTIC FLUID FLOW METER

Jeffrey S. Gutterman, Hilton, N.Y., assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 23, 1984, Ser. No. 643,560

Int. Cl.[4] G01F *1/66*

U.S. Cl. 73—861.28 **2 Claims**



1. An acoustic fluid flow meter including a conduit for carrying fluid flow comprising

a pair of acoustic transducers mounted on one wall of a conduit, one transducer being located upstream of the other such that acoustic signals emitted from either transducer reflect from an opposite wall to the other transducer, the opposite wall comprising one or more circular cylindrical reflecting surfaces each having a cylinder axis passing through the transducers so that signals from either transducer transmitted across the conduit and reflected from the reflecting surfaces will be focused on the other transducer.

4,555,952

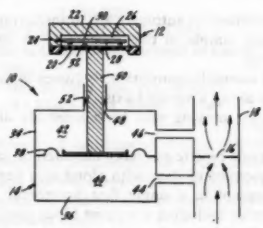
DIFFERENTIAL PRESSURE SENSOR

Patrick A. Jenkins, Decatur, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Jun. 8, 1984, Ser. No. 618,667

Int. Cl.[4] G01F *1/38*

U.S. Cl. 73—861.47 **5 Claims**



1. A differential pressure sensor assembly for measuring the pressure drop across an orifice in a fluid flow passage at a location displaced from the orifice and passage, comprising:

a transducor means including a housing, a first diaphragm operator, and an electronic signal means sealed in said housing and operable in response to movement of said first diaphragm operator;

a sensing and pressure-response transfer means, including a wall structure defining an enclosure, a second diaphragm operator postioned in said enclosure to define an inlet chamber and an outlet chamber therein, said wall structure defining a stem port, an inlet port communicating between said inlet chamber and said fluid passage upstream of said orifice, and an outlet port communicating between said outlet chamber and said fluid passage downstream of said orifice;

a stem connected to and operable by said second diaphragm operator, which stem extends through said stem port to contact said first diaphragm operator; and

seal means to seal fluid flow through said stem port, the pressure drop across said orifice being monitored by said pressure-response transfer means and transmitted by said stem to said transducer means.

4,555,953

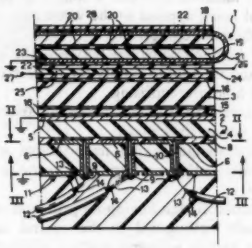
COMPOSITE, MULTIFUNCTIONAL TACTILE SENSOR

Paolo Dario, Via Saffi 35, Livorno, and Danilo E. De Rossi, Via Del Cantone 41, S. Giuliano Terme (Pisa), both of Italy

Filed Apr. 16, 1984, Ser. No. 600,738

Int. Cl.[4] G01L *1/16, 5/16*

U.S. Cl. 73—862.04 **27 Claims**



22. A composite tactile sensing device, comprising

a superficial (epidermal) sensing layer including a first ferroelectric polymer transducer, and

a deep (dermal) sensing layer, including a plurality of ferroelectric polymer transducers adapted to detect difference force components and located according to a matrix-like array.

4,555,954

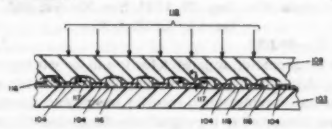
METHOD AND APPARATUS FOR SENSING TACTILE FORCES

Byoung S. Kim, Hamilton Township, Mercer County, N.J., assignor to AT&T Technologies, Inc., Berkeley Heights, N.J.

Filed Dec. 21, 1984, Ser. No. 684,683

Int. Cl.[4] G01L *5/16*; H01C *10/10*

U.S. Cl. 73—862.04 **7 Claims**



1. A method for sensing forces comprising the steps of:

deforming an elastomeric sheet, having alternating electrically conductive and nonconductive strips, by applying a force thereagainst to urge the conductive strips into contact with each of a plurality of electrically conductive foils on a substrate underlying the elastomeric sheet, the electrically conductive foils being separated from each other by upraised, insulative regions on the substrate which support the conductive strips; and

sensing the size and location of each area of contact between each conductive strip and each conductive foil on the substrate to determine the magnitude of, and the location of a force applied to the elastomeric sheet.

4,555,955

COMBINATION LOADING TRANSDUCER

Paul W. Morgan, Waterford Township, Oakland County; Thomas J. Ellwood, Harrison Township, Clare County; Kish D. Amlani, Troy, and John B. Hodges, Brighton, all of Mich., assignors to Eaton Corporation, Cleveland, Ohio

Filed Jan. 27, 1984, Ser. No. 574,446
Int. Cl.[4] G01L *5/16*
U.S. Cl. 73—862.06 **24 Claims**

1. A torque and thrust sensor for machine tools of the type in which the machine provides a source of drive power to a tool, the tool being applied to the workpiece in order to perform work thereon, comprising:

(a) a tool holder connected between the source of drive power and the tool to supply the drive power to the tool, the tool holder comprising:

(i) a central axis running generally from the source of drive power to the tool,

(ii) a first flange having its principal surface oriented generally orthogonal to the central axis of the tool holder,

(iii) a second flange having its principal surface oriented generally orthogonal to the central axis of the tool holder and its principal surface positioned apart from and facing the principal surface of the first flange,

(iv) a plurality of beams connected at one of their ends to the principal surface of the first flange and at their other ends to the principal surface of the second flange, the connection to the flanges being adjacent the periphery of the flanges and the beams each being connected at an angle phi with respect to the central axis for bending in response to torque or axial loading of the tool holder.

(b) a strain gage device mounted on a beam and oriented to measure a desired strain in the beam produced by the operation of the tool on the workpiece.

4,555,956

TORQUEMETER APPARATUS

Richard B. Reich, Algonquin, Ill., assignor to S. Himmelstein and Company, Hoffman Estates, Ill.

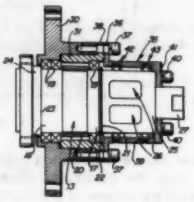
Continuation of Ser. No. 491,548, May 4, 1983, abandoned. This application Aug. 29, 1984, Ser. No. 645,540
Int. Cl.[4] G01L *3/10*
U.S. Cl. 73—862.32 **22 Claims**

1. In a torquemeter apparatus for use in measuring torque in a rotating drive having a driver member and a driven member, said apparatus having signal transfer means and a torque sensing means connected to the signal transfer means, the improvement comprising:

means for rotatably journaling said driven member to said driver member;

means for mounting the torque sensing means to said driver member outboard of said journaling means; and

flexible coupling means for transmitting driving force from said driver member outboard of said torque sensing means to said driven member, whereby extraneous forces acting



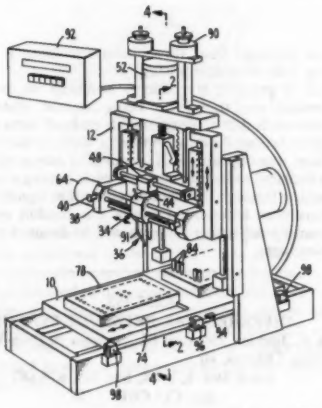
on said driven member during measurement of said torque are isolated from said torque sensing means and substantially only torque forces acting coaxially of said driver member are transferred from said driven member to said torque sensing means.

4,555,957

BI-DIRECTIONAL LIQUID SAMPLE HANDLING SYSTEM

Arthur E. Frankel, Palo Alto; Larry J. Johnson, San Jose, and Timothy J. Wennberg, San Francisco, all of Calif., assignors to Cetus Corporation, Emeryville, Calif.

Filed Oct. 14, 1983, Ser. No. 542,113
Int. Cl.[4] G01N *35/06*
U.S. Cl. 73—864.14 **11 Claims**



1. A machine for automatically transferring at least a portion of a liquid sample in one receptacle to another receptacle, comprising:

a head assembly translatable between upper and lower positions along a vertical axis;

means for moving said head assembly along said vertical axis;

at least one pipette assembly mounted on said head assembly for movement therewith along said vertical axis and for movement in a single first horizontal axis, said pipette assembly including a support block carried on a first horizontal guide member and a pipette nozzle mounted on said support block and having a depending end for receiving tips, a slide block carried on a second horizontal guide

member parallel to the first guide member, a plunger mounted on said slide block and depending within said pipette nozzle, and means for moving said plunger within said pipette nozzle to vary the internal volume of said nozzle and a tip supported thereby;

means for moving said pipette assembly relative to said head assembly along said first horizontal axis;

a table mounted beneath said head for translation along a second horizontal axis that is transverse to the first horizontal axis, said table having at least two work stations spaced along its axis of translation for respectively accommodating at least one tray having a plurality of receptacles;

means for moving said table along said second horizontal axis to place any selected one of said plurality of receptacles in a tray mounted on said table at either of said work stations in registry with said pipette assembly; and

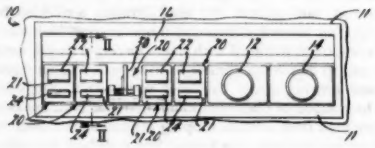
means for controlling each of said moving means for said head assembly, pipette assembly, plunger and table to effect transfer of a liquid sample between at least one receptacle in said try mounted at one of said stations to at least one receptacle located at the other of said work stations.

4,555,958

FLIP-DOWN PUSHBUTTON END CAPS FOR A RADIO TUNER

John P. Stoddard, London, England, assignor to Ford Motor Company, Dearborn, Mich.

Filed Jul. 9, 1984, Ser. No. 629,154
Int. Cl.[4] H03J *5/12*; G05G *1/02*
U.S. Cl. 74—10.33 **8 Claims**



1. In a radio tuner assembly which includes a plurality of slider elements each disposed on the front thereof for bi-directional longitudinal movement about and away from a defined normal locked station de-select position to a defined locked station select position or to a defined unlocked position;

a pushbutton means disposed on each slider element for movement therewith and having a face plate that is pivotal between a first orientation suitable for manual depression of the corresponding pushbutton and the slider element to its defined locked station select position and a second orientation suitable for manual pulling of the corresponding pushbutton means and the slider element to the defined unlocked position.

4,555,959

SHIFT CONTROL SYSTEM

Eugene R. Braun, Royal Oak, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed May 9, 1983, Ser. No. 493,117
Int. Cl.[4] F16H *3/08*; B60K *20/14*
U.S. Cl. 74—334 **10 Claims**

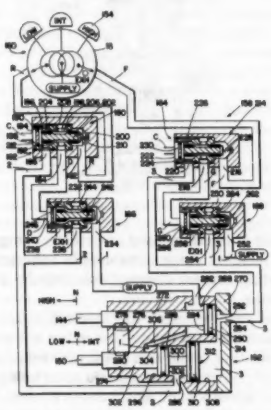
1. A control system for a multi-speed change gear transmission of the type permitting preselection of a gear change to be executed immediately upon achievement of enabling transmission operating conditions, said control system comprising;

a source of pressurized fluid;

an operator actuated gear selection valve movable to a plurality of positions to preselect a desired engaged gear in said transmission, said selector valve connected to said source of pressurized fluid and effective in one position thereof to connect said source of fluid to a first fluid conduit and in at least another position thereof to block said source of pressurized fluid and to connect said first conduit to exhaust;

at least one three way-two position preselect prohibit valve, said preselect prohibit valve having a first port therein connected to said first conduit, a second port connected to a second conduit and a third port connected to a third conduit, said prohibit valve including a valve member slidable therein and biased to a first position for blocking said first port and establishing fluid communication between said second and third port and movable against said bias to a second position for blocking said third port and establishing fluid communication between said first and second ports to place said first and second conduits in fluid communication, said prohibit valve including a first pilot port connected to a pilot conduit, pressurization of said pilot conduit effective to move said valve member from said first to said second position;

at least one three way-two position preselect valve, said preselect valve having a fourth port connected to a fourth conduit in constant communication with said source of pressurized fluid, a fifth port connected to said third conduit and a sixth port connected to a sixth conduit con-



stantly connected to an exhaust, said preselect valve having a first position for blocking said fourth port to block communication between said constantly pressurized fourth conduit and said third conduit and establishing fluid communication between said fifth port and said sixth port to exhaust said third conduit and a second position for blocking said sixth port to block fluid communication between said third conduit and said exhaust and for establishing fluid communication between said fourth port and said fifth port to establish fluid communication between said constantly pressurized fourth conduit and said third conduit, said preselect valve having a second pilot port connected to said second conduit, pressurization of said second conduit effective to move said valve member to said second position thereof to pressurize said third conduit from said constantly pressurized fourth conduit;

an actuation valve having at least one shift piston therein connected to means for shifting said transmission, said piston having a first face acted upon by pressure in said constantly pressurized fourth conduit and an opposed larger second face acted upon by pressure in said third conduit whereby pressurization and exhaust of said third conduit will cause said piston to move to a first and second, respectively, operating positions; and

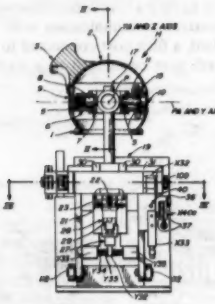
an operator actuated preselect prohibit release switch valve, said preselect prohibit release switch valve having a seventh port connected to said source of pressurized fluid, an eighth port connected to an exhaust conduit and a ninth port connected to said pilot conduit, said preselect prohibit valve biased to block said seventh port and establish fluid communication between said eighth and ninth ports to exhaust said pilot conduit and movable upon actuation thereof to block said eighth port and establish fluid communication between said seventh and ninth ports to pressurize said pilot conduit.

4,555,960

SIX DEGREE OF FREEDOM HAND CONTROLLER

Michael King, Amsterdam, Canada, assignor to CAE Electronics, Ltd., Montreal, Canada

Filed Mar. 23, 1983, Ser. No. 477,987
Int. Cl.⁴ G05G 9/02
U.S. Cl. 74—471 XY **6 Claims**



1. A 6 degree of freedom hand controller, comprising:

a handgrip member being substantially spherical in shape and including a point disposed substantially centrally of said member;

an elongated shaft member for supporting said handgrip member such that said handgrip member is rotatable, from an initial position, about said point, said rotational motion of said handgrip member about said point being resolvable into motion about a pitch axis, passing through said point, a roll axis at right angles to said pitch axis and also passing through said point, and a yaw axis, at right angles to both said pitch axis and said roll axis and also passing through said point;

said elongated shaft member being movably supported such that said handgrip member is movable, from said initial position, in translational motion resolvable into motion along said pitch, roll and yaw axes and through said point;

whereby, said rotational motion of sid member comprises motion of sid member about said point; and

whereby the effective lines of thrust of said translational motion of said member pass through said point;

whereby translational motion is detected by movement of a shaft along a respective translational axis, said means for sensing translational motion comprising a pair of load cells, each one of said pair being disposed on a different side of said shaft in the direction of motion thereof, a spring between each said load cell and its respective shaft, and a button disposed at the free ends of each of said springs;

the space between said shaft and said button comprising the free play of the handgrip member along the respective translational axis;

whereby, when said handgrip member is moved so that said shaft touches said button, this comprises a soft stop; and

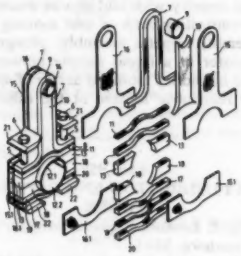
when said shaft is moved so that the spring is no longer compressible in that direction, this constitutes a hard stop.

4,555,961

CONNECTING ROD MADE OF FIBER REINFORCED SYNTHETIC MATERIAL

Thomas Fischer, Augsburg, Fed. Rep. of Germany, assignor to Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung, Munich, Fed. Rep. of Germany

Filed Jun. 27, 1983, Ser. No. 508,031
Claims priority, application Fed. Rep. of Germany, Jul. 7, 1982, 3225324; Jul. 7, 1982, 3225325
Int. Cl.⁴ G05G 1/00
U.S. Cl. 74—579 E **19 Claims**



1. A connecting rod made of fiber reinforced synthetic material and having a longitudinal rod axis, comprising a first rod head at one end of the rod, said first rod head including a cylindrical closed bearing, a second rod head at the other end of the rod, said second rod head forming a divided bearing including an inwardly disposed inner bearing bail made of a fiber compound material with fibers having a length extending from end to end of said inner bearing bail, and an outwardly disposed bearing cover bail, said rod further comprising an open loop made of fiber compound material with unidirectionally oriented fiber strands looping around said closed bearing and forming two loop legs having free ends bent laterally away substantially at right angles from said rod axis to form two flanges with bores therein, said fiber strands of said open loops having a length extending in said open loop from free end to free end of said open loop and into said flanges, and a compression member made of fiber compound material with fiber strands oriented substantially in parallel to said longitudinal rod axis, said compression member extending lengthwise between said closed bearing and said inwardly disposed bearing bail and laterally between said loop legs, said inwardly disposed bearing bail interconnecting said loop flanges in a force transmitting manner for holding said loop legs with their free ends together, said cover bail also having flanges with bores at its ends, and connecting means extending through all bores for connecting all flanges for mounting the connecting rod, whereby said inner bearing bail in cooperation with said connecting means holds said free loop ends in place.

10. A connecting rod made of fiber reinforced synthetic material and having a longitudinal rod axis, comprising a first rod head at one end of the rod, said first rod head including a cylindrical closed bearing, a second rod head at the other end of the rod, said second rod head forming a divided bearing including an inwardly disposed inner bearing bail made of a fiber compound material having fibers extending from end to end of said inner bearing bail forming a saddle, an outwardly disposed bearing cover bail cooperating with said saddle in forming said divided bearing, said rod further comprising an endless fiber loop folded back on itself for forming an open loop made of said fiber compound material with unidirectionally oriented fiber strands looping around said closed bearing, said endless fiber loop forming two loop legs having free ends, each free end forming a closed leg loop, a compression mem-

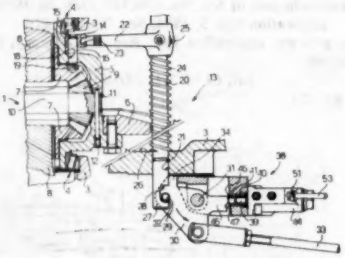
ber made of fiber compound material with fiber strands oriented substantially in parallel to said longitudinal rod axis, said compression member extending lengthwise between said closed bearing and resting on said saddle formed by said inwardly disposed bearing bail and laterally between said loop legs, said inwardly disposed bearing bail and said cover bail extending between said closed loop legs, and connecting bolt means extending through one of said closed leg loops, through said inner bearing bail, through said cover bail and then again through said inner bearing bail and through the other of said leg loops for mounting the connecting rod, said connecting bolt means connecting said bails and said closed loop legs in a force transmitting manner.

4,555,962

MANUALLY ENGAGED AND AUTOMATICALLY DISENGAGED LOCKING DEVICE FOR A VEHICLE DIFFERENTIAL

Luciano Bucarelli, Modena, Italy, assignor to Fiat Trattori S.p.A., Modena, Italy

Filed Dec. 7, 1983, Ser. No. 558,793
Claims priority, application Italy, Dec. 21, 1982, 68493 A/82
Int. Cl.⁴ F16H *1/445*
U.S. Cl. 74—710.5 **12 Claims**



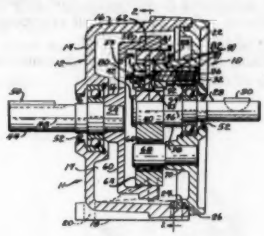
1. A locking device (13) for a differential (1) of a vehicle (2) comprising engagement means (14, 16) for rigidly angularly connecting a bevel gear (7) of the differential (1) with a differential housing (5) thereof, said engagement means (14, 16) being carried by said differential housing (5), and actuating linkage means (20, 30, 33) for operating said engagement means, said actuating linkage manually controlled by an operator, and operable for moving said engagement means (14, 16) from a rest position in which said engagement means is not engaged with said bevel gear (7), to a working position in which said engagement means is engaged with said bevel gear (7) to rigidly interconnect said bevel gear with said differential housing (5) and in which said housing drives said bevel gear, characterised by the fact that said linkage means includes resilient means (24) for urging said engagement means (14, 16) towards said rest position, and locking means (38) for releasably locking said engagement means (14, 16) in said working position against the urging action of said resilient means (24), said locking means comprising a finger (38), which is positively actuated by hydraulic means (48) to retract and unlock said engagement means (14, 16), said hydraulic means operatively connected to at least one brake line of the vehicle brakes, said locking means (38, 39) being released automatically when a brake (54) of said vehicle which is connected to said one brake line (2) is actuated, said engagement means (14, 16) remaining in said working position after release of said locking means (38, 39) until said housing (5) ceases to drive said bevel gear (7) whereupon said engagement means (14, 16) moves to said rest position by the action of said resilient means.

4,555,963

TORQUE LIMIT DRIVE TRANSMISSION

Bertel S. Nelson, Naperville, Ill., assignor to Wedgtrac Corporation, Yorkville, Ill.

Continuation of Ser. No. 552,863, Nov. 17, 1983, Pat. No. 4,481,842, and a continuation of Ser. No. 297,744, Aug. 31, 1981, abandoned. This application Nov. 25, 1983, Ser. No. 555,202
The portion of the term of this patent subsequent to Nov. 13, 2001, has been disclaimed.
Int. Cl.⁴ F16H *13/06, 13/02*
U.S. Cl. 74—798 **6 Claims**



1. Roller friction gearing comprising a driving shaft, a driven shaft, the center lines of said shafts being parallel but offset radially of one another, an external annular roller-engaging surface secured to one of said shafts, means secured to the other of said shafts and having an internal annular roller-engaging surface, the spacing between said surfaces varying due to the offset of the center lines of said shafts and providing a narrowing pocket between said surfaces in the direction of rotation of the driving shaft, a plurality of rollers between said surfaces and acting to transmit torque from said driving shaft to said driven shaft, one of said rollers being a wedging roller mounted in said pocket and capable of moving further into said pocket as torque transmitted between said shafts causes relative deformation thereof, said wedging roller having an inner annular surface and disposed loosely about an axle, a cross-pin disposed in said axle in substantially tangential orientation with a first end oriented toward said pocket and a second end oriented away from said pocket, said cross-pin having a notch therein formed by a first surface relatively toward said first end and having a relatively large angle relative to the axis of said wedging roller and a second surface relatively toward said second end and having a relatively shallow angle relative to said axis, an axial pin having a tapered end received in said notch and having first and second surfaces complementary to said notch first and second surface, and spring means urging said axial pin end into said notch, said first surfaces initially engaging to bias said wedging roller into said pocket, said cross-pin following said roller until said axial pin end bottoms in said notch, the opposite end of said cross-pin subsequently engaging said inner annular surface to limit movement of said wedging roller into said pocket to limit torque transmitted by said gearing.

4,555,964

HYDRAULIC CONTROL SYSTEM FOR AUTOMATIC TRANSMISSION WITH SHOCKLESS 4–3 SHIFTING AS WELL AS SHOCKLESS 2–3 SHIFTING

Kazuhiko Sugano, Zama, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Feb. 17, 1984, Ser. No. 581,506
Claims priority, application Japan, Mar. 10, 1983, 58-38354
Int. Cl.⁴ B60K *41/08;* F16H *57/10*
U.S. Cl. 74—869 **1 Claim**

1. A hydraulic control system for an automatic transmission which provides at least three forward speed ratios and shiftable to a n+2 th speed ratio, a n+1 th speed ratio and a n th speed ratio, the automatic transmission including a first, a second and

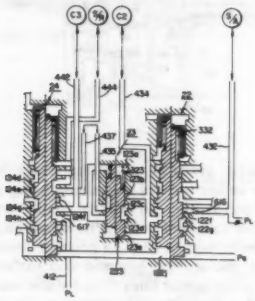
a third friction units, the n+2 th speed ratio being established when fluid pressure is supplied to a fluid chamber of the first friction unit and fluid pressure is discharged from both fluid chambers of the second and third friction units, the n+1 th speed ratio being established when fluid pressure is supplied to all fluid chambers of the first, second and third friction units, and the n th speed ratio being established when fluid pressure is supplied to the third friction unit and fluid pressure is discharged from fluid chambers of the first and second friction units,

the hydraulic control system comprising:

means for generating an actuating fluid pressure;

means defining a first fluid conduit connected to the fluid chamber of the first friction unit;

means defining a second fluid conduit connected to the fluid chamber of the third friction unit;



a changeover valve having a first position wherein said first fluid conduit is allowed to communicate with the fluid chamber of the second friction unit and a second position wherein said second fluid conduit is allowed to communicate with the fluid chamber of the second friction unit,

said changeover valve assuming the first position thereof when the first fluid conduit is supplied with fluid pressure, said changeover valve assuming the second position thereof when said second fluid conduit is supplied with fluid pressure;

means for supplying the actuating fluid pressure to said first fluid conduit at a first predetermined flow rate in shifting from the n th speed ratio to the n+1 th speed ratio; and

means for supplying the actuating fluid pressure to said second fluid conduit at a second predetermined flow rate in shifting from the n+2 th speed ratio to the n+1 th speed ratio.

4,555,965

SCISSORS CORRUGATING DEVICE

Mark E. Deaton, Ogden, Utah, assignor to Wright State University, Dayton, Ohio

Filed Apr. 30, 1984, Ser. No. 605,325

Int. Cl.[4] B23D *71/02*; **B21K** *11/02*

U.S. Cl. 76—89.1 **14 Claims**

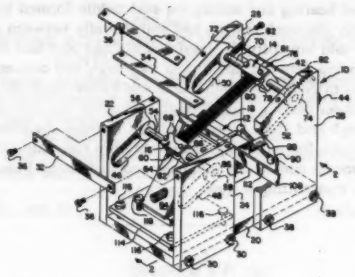
1. A scissors corrugating device comprising:

an elongate corrugating file;

upper guide means attached to said file at an upper end thereof, for guiding said upper end along a first path at a first angle to the horizontal;

lower guide means attached to said file at a lower end thereof, for guiding said lower end along a second path at a second angle to the horizontal, said second angle being less than said first angle; and

means for adjustably holding a scissors' blade beneath said file at a predetermined position such that a beveled edge thereof faces said file so that movement of said upper and lower guide means along said first and second paths, respectively, causes said file to be drawn across and down



into an associated beveled edge, thereby scoring even corrugations therein.

4,555,966

PUNCH PRESS WITH MULTITOOL PUNCH ASSEMBLY

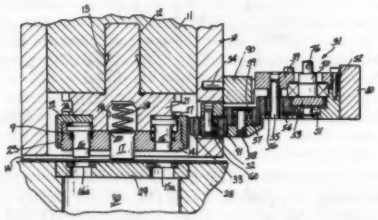
Hans Klingel, Moglingen, Fed. Rep. of Germany, assignor to Trumpf GmbH & Co., Ditzingen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 546,745, Oct. 28, 1983. This application Sep. 5, 1984, Ser. No. 647,419

Claims priority, application Fed. Rep. of Germany, Nov. 6, 1982, 3241046

Int. Cl.[4] B21D *28/02*

U.S. Cl. 83—71 **20 Claims**



1. In a punch press, the combination comprising:

A. a housing;

B. a ram reciprocatably mounted in said housing; and

C. a multitool punch assembly operatively coupled to said ram, said assembly comprising:

(i) a coupling member,

(ii) a punch pin support member,

(iii) at least two punch pins disposed within bores in said support member and having a working end adapted to strike an associated workpiece and an opposite end, said pins being movable in said bores along axes parallel to the axis of reciprocation of said ram from an operative working position to an elevated inoperative position,

(iv) a cam member mounted for rotation about said support member, said rotatable cam member having a cam surface thereon adapted to overlie said opposite end of any one of said punch pins in said support member upon rotation thereabout, said cam member moving a selected one of said punch pins from its retracted position to its working position, and

(v) means for returning previously selected punch pins to its inoperative position;

D. drive means in said housing engageable with said rotatable cam member for effecting rotation thereof to effect

selection and movement of various punch pins in said multitool assembly;

E. means for moving said drive means into engagement with said rotatable cam member of said multitool punch assembly to effect rotation thereof and for retracting said drive means to an inoperative portion free from engagement with said cam member; and

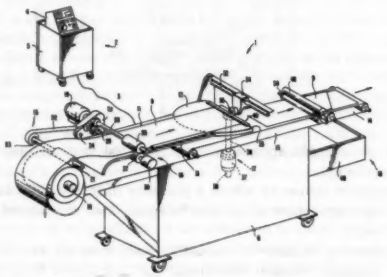
F. control means for operating said moving means to move said drive means into engagement with said rotatable cam member and then to effect operation of said drive means to rotate said cam member to selectively move a punch pin into working position and then to operate said moving means to retract said drive means to its inoperative position.

4,555,967

MACHINE FOR CUTTING PIECES FROM A BAND MATERIAL

Jean-Pierre Jumel, Le Vesinet, France, assignor to Societe Nationale Industrielle et Aerospatiale, Paris, France

Filed Aug. 16, 1983, Ser. No. 523,793
Claims priority, application France, Aug. 17, 1982, 82 14211
Int. Cl.⁴ B26D *5/40*
U.S. Cl. 83—106 **10 Claims**



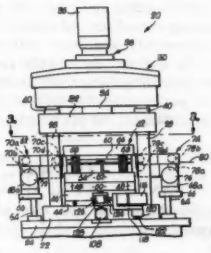
1. A machine for cutting at an angle, along a straight, broken, oblique, or right-angled cutting line, a band material adapted to be fed parallel to its length and resting on a substantially planar support surface, comprising in combination: a train mounted for rotation about an axis generally at right angles to said support surface and carrying a cutting system executing a reciprocating movement generally at right angles to said support surface and carrying a cutting system executing a reciprocating movement generally transversely to said band along a cutting edge; a first means for unwinding said band at constant linear speed from a reel; a second means for feeding said unwound band at constant linear speed onto a fixed plane support; said fixed plane support extending at least from said second means into proximity of said cutting system; said second means also permitting an edge of said band to be applied against a lateral edge guide; and a third means for measuring the length of band which passes from said second means to said cutting system, said third means for measuring determining a reference line at right angles to said band and arranged at a predetermined fixed distance D from said axis of rotation of said train, said axis of rotation of said train passing through said cutting edge and being at a constant distance from said edge of the band in abutment against said lateral edge guide; said support surface including two mutually spaced continuous conveyors having a gap therebetween and a mobile deflector, said mobile deflector being selectively capable of assuming an inactive position wherein predetermined cut pieces pass from one of said two continuous conveyors to the other by straddling said gap between said conveyors, and an active position wherein said deflector causes other pieces to pass into the gap between said conveyors; and wherein said deflector is mounted on at least a rocker arm and is associated with a pressure roller mounted on said rocker arms and cooperating with the upstream one of said two continuous conveyors in said active position of said deflector to increase the adhesion of said other pieces to said upstream conveyor and therefore favor passage of said other pieces into said gap between said conveyors; whereby precisely determinable lengths of band can be cut.

4,555,968

WEB FED DIE CUTTING PRESS HAVING AUTOMATIC 3-AXIS DIE REGISTRATION SYSTEM

Charles C. Raney, Kansas City, and James T. Gramling, Basehor, both of Kans., assignors to Preco Industries, Inc., Shawnee Mission, Kans.

Filed Jun. 7, 1984, Ser. No. 618,421
Int. Cl.⁴ B26D *5/34*
U.S. Cl. 83—209 **20 Claims**



1. A die cutting press for web material having indicia on opposite, longitudinally extending sides thereof associated with each defined area of the web to be die cut, the indicia on opposed sides of the web which are related to a particular defined web area each being provided with a segment which extends transversely of the web and at least one of the opposed, related indicia having a section disposed longitudinally of the web, said press comprising:

a base platen defining a web material work station;

means for mounting a die unit on the base platen below said power operated means in disposition for rotation about an upright axis and shifting of the die unit in a direction at least transversely of the path of travel of a web through the press;

means for effecting rotation of the die unit on said base platen;

power operated means shiftable toward and away from said platen;

web backup means carried by the power operated means cooperable with the die unit to present a web processing work station therebetween;

means for shifting the die unit transversely of an area of the web situated at said press work station;

means for feeding the web material on an incremental basis to sequentially position successive defined areas of the web at said press work station;

first sensing means movable with the die unit and having sensors positionable to sense the presence of indicia on opposite sides of web at said work station, said first sensing means being operable to determine the presence of a segment of an indicium which first presents itself to said first sensing means as the web is moved by the feeding means through a displacement to bring the next defined area of the web to said press work station;

means controlled by said first sensing means and coupled to said web feeding means and to said die unit rotating means for effecting rotation of the die unit to an extent as may be necessary and in a direction to bring the segment of the opposed indicium related to be indicium segment first sensed by said first sensing means during movement of a

particular defined area of the web to the press work station, into a location where such opposed, related segment is sensed as being present by the first sensing means, while continuing operation of the web feeding means to move the web longitudinally of the length thereof as may be necessary to maintain the presence sensing relationship between the first sensing means and the segment of the indicium which was first sensed by first sensing means as said next defined area of the web is moved to the press work station;

second sensing means movable with the die unit and having sensors positionable to sense the presence and relative position to the second sensing means of the indicium section associated with a respective defined area of the web; and

means controlled by said second sensing means and coupled to said die unit shifting means for effecting shifting of the die unit transversely of a respective defined area of the web to an extent as may be necessary to bring the section of a corresponding indicium into predetermined relative relationship to said second sensing means whereby the die unit is accurately positioned with respect to each defined area of the web moved into the press work station; and

means for actuating the power operated means only after accurate positioning of a defined area of the web at said press work station has occurred.

4,555,969

PANEL SAWING APPARATUS

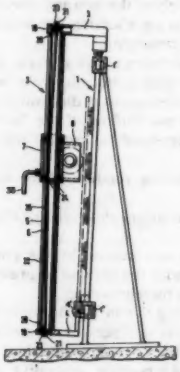
Anton Abt, Oberboihingen, Fed. Rep. of Germany, assignor to Reich Spezialmaschinen GmbH, Nuertingen, Fed. Rep. of Germany

Filed Apr. 20, 1983, Ser. No. 486,661

Claims priority, application Fed. Rep. of Germany, May 3, 1982, 3216441; Feb. 12, 1983, 3304877

Int. Cl.[4] B26D *1/14*

U.S. Cl. 83—471.3 **8 Claims**



1. A panel sawing apparatus, comprising substantially upright panel supporting rack means (1), guide carriage means (2) slidably mounted on said rack means for a back and forth movement, saw slide means (7) movably mounted on said guide carriage means for up and down movement, said guide carriage means (2) comprising carriage head means (3), carriage guide foot means (4), a support beam (5) and an abutment beam (6) operatively interconnecting said head means (3) and said foot means (4), said beams (5, 6) being made of standard stock sectional steel and extending in parallel to each other, said saw slide means (7) being movably mounted on said support beam (5) for up and down movement on said support beam, further comprising adjustable tensioning means (22) arranged for cooperation with said abutment beam (6) for applying a force to said abutment beam (6) which force is effective substantially perpendicularly to a longitudinal axis of said abutment beam for elastically deforming said abutment beam.

4,555,970

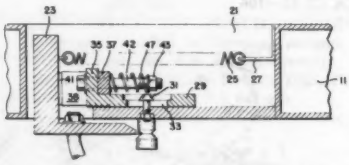
TREMOLO APPARATUS CAPABLE OF INCREASING TENSION ON THE STRINGS OF A MUSICAL INSTRUMENT

Floyd D. Rose, 2727 NE. 145th, Seattle, Wash. 98155

Filed Jun. 15, 1983, Ser. No. 504,383

Int. Cl.[4] G10D *3/12*

U.S. Cl. 84—313 **22 Claims**



1. A tremolo apparatus for a stringed musical instrument comprising:

tremolo means to which a plurality of strings of a musical instrument are adapted to be secured for movement therewith;

mounting means for mounting said tremolo means on a stringed musical instrument for movement from a first position to a second position to simultaneously decrease the tension of said plurality of strings, and for movement from said first position to a third position to simultaneously increase the tension of said plurality of strings;

tremolo moving means for moving said tremolo means from said first position toward said second position and for moving said tremolo means from said first position toward said third position;

a moveable stop member engageable with said tremolo means, said stop member being moveable between a first member position and a second member position displaced from said first member position, and said moveable stop member being arranged with respect to and cooperating with said tremolo means such that (i) said tremolo means is in said first position when said stop member is in said first member position and said tremolo means is in engagement therewith, (ii) said tremolo means is out of engagement with said stop member when said tremolo means is in one of said second and third positions, and (iii) said tremolo means is in engagement with said stop member and said stop member is in said second member position when said tremolo means is in the other of said second and third positions; and

tremolo return means comprising first spring means urging said moveable stop member toward said first member position, and second spring means urging said tremolo means toward said stop member, whereby said tremolo means is normally positioned at said first position and is urged by said tremolo return means to return to said first position upon release of said tremolo moving means after having been moved to either of said second or third positions.

4,555,971
METHOD AND APPARATUS FOR COVERING A TARGET AREA WITH AMMUNITION

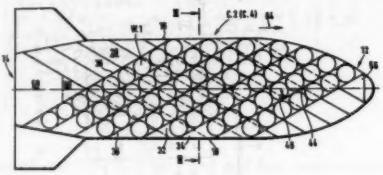
Rudolf Romer, Kaarst; Christian Jaeneke, Düsseldorf; Karl W. Bethmann, Moers, and Manfred Moll, Düsseldorf, all of Fed. Rep. of Germany, assignors to Rheinmetall GmbH, Düsseldorf, Fed. Rep. of Germany

Filed Jul. 14, 1982, Ser. No. 398,242

Claims priority, application Fed. Rep. of Germany, Jul. 14, 1981, 3127674

Int. Cl.⁴ F42B *25/06, 25/16;* **B64D** *1/04;* **F41F** *5/02*

U.S. Cl. 89—1.11 **10 Claims**



1. A method for covering a target area with scattered ammunition from a container, wherein the ammunition to be scattered is in the form of active units having an essentially circular cross section disposed in a plurality of essentially linear receptacles closed at one end and provided with an outlet opening, wherein a plurality of the receptacles enclose an acute angle with the longitudinal axis of the container and at least one of the receptacles is arranged parallel to the longitudinal axis of the container, and wherein a plurality of active units are disposed in each receptacle, said method comprising the steps of:

moving the container with the active units toward the target at a given height;

discharging the active units from the container by a sudden change of acceleration of the container to cause the active units to move with respect to the container under the effect of their inertial mass in the direction toward the outlet opening and leave the container through said outlet opening to embark on an individual flight path toward the target surface; and,

during the movement of the active units in said receptacles, causing the active units to rotate about their axis of rotational symmetry, which is simultaneously their active axis.

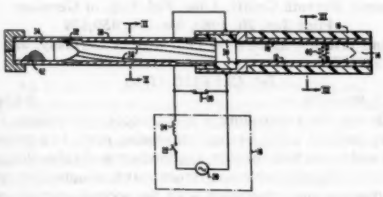
4,555,972
ELECTROMAGNETIC LAUNCHER WITH POWDER DRIVEN PROJECTILE INSERTION

Carl J. Heyne, Hampton Township, Allegheny County, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 20, 1982, Ser. No. 451,566

Int. Cl.⁴ F41F *1/02*

U.S. Cl. 89—8 **1 Claim**



1. An electromagnetic projectile launcher comprising:

a pair of generally parallel conductive rails lining an unrifled bore;

a source of electric current connected to said conductive rails;

a rifled barrel disposed adjacent to one end of said conductive rails and axially aligned with said bore;

means for electrically insulating said barrel and said conductive rails; and

means for propelling a projectile through said rifled barrel thereby causing said projectile to spin and then for propelling said projectile through said unrifled bore, said propelling means including a chemical propellant, said propellant combustile for propelling said projectile through said rifled barrel and for initiating a plasma by electrical breakdown of gases resulting from combustion of said propellant, said plasma for conducting current between said conductive rails and for propelling said projectile along said rails.

4,555,973
AUTOMATIC HAND FIREARM OPERATING AND SAFETY HANDLE

Jali Timari, Hatanpäänvaltatie 32, SF-33100 Tampere 10, Finland

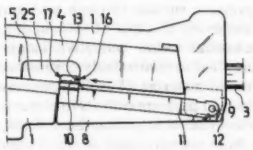
PCT No. PCT/FI83/00017, § 371 Date Oct. 24, 1983, § 102(e) Date Oct. 24, 1983, PCT Pub. No. WO83/02998, PCT Pub. Date Sep. 1, 1983

PCT Filed Feb. 25, 1983, Ser. No. 551,995

Claims priority, application Finland, Feb. 26, 1982, 820713

Int. Cl.⁴ F41C *7/00*

U.S. Cl. 89—148 **4 Claims**



1. An automatic hand firearm with mass obturation, comprising:

a body incuding a handle,

a barrel;

a slide mounted for reciprocal movement between a rear cocked position and a forward position within said body;

cocking means for holding said slide in said cocked position until released by a fire mechanism;

a slide member disposed forward of an engageable with said slide, said slide member being slidably mounted within the body substantially in the direction of said barrel;

an operating handle pivotally connected to said slide member and pivotable from a stored position to a firing and support position substantially perpendicular to the longitudinal axis of said barrel, operating handle movable rearwardly with said slide member, said slide having a forward facing engaging face and a rearward facing engaging face, said handle having a rear facing bracing face disposed to be engaged by said forward facing engaging face when the slide is in the cocked position and said handle is in the stored position, said handle also having a forward facing bracing face to be engaged by said rear facing engaging face when the slide is in the uncocked position and said handle is in the stored position, said slide member disposed to engage said forward facing engaging face on rearward movement of said slide to draw said slide rearwardly into said cocked position.

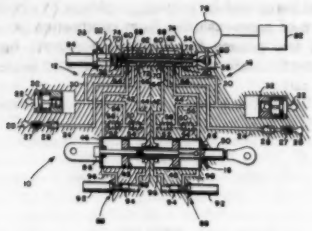
4,555,974
SERVO ACTUATOR CONTROL/DAMPING MECHANISM AND METHOD

James S. Mason, Marcellus, and David Foerster, Paw Paw, both of Mich., assignors to Pneumo Corporation, Boston, Mass.

Continuation of Ser. No. 529,115, Sep. 2, 1983, abandoned. This application Apr. 24, 1985, Ser. No. 726,920

Int. Cl.[4] F15B 9/09

U.S. Cl. 91—363 A 14 Claims



1. A servo mechanism for use in a fluid servo system for controlling a fluid powered ram actuator having opposed pressure surfaces, comprising a servo valve including valve means selectively positionable therein to provide variable fluid pressure and return flow orifices for metering fluid flow to and return flow from the opposed pressure surfaces of the ram, means for connecting a source of high pressure fluid to said servo valve for metered passage to either pressure surface through said variable fluid pressure orifices, means for directing bypass fluid flow from either pressure surface of the ram to the other pressure surface through said variable return flow orifices in the event of a loss of such high pressure fluid, and electro-mechanical means operative independently of such high pressure fluid to controllably position said valve means to effect controlled metering of such high pressure fluid through said variable fluid pressure orifices to either pressure surface of the ram for controlled actuation thereof and, in the event of a loss of such high pressure fluid, to effect regulated metering of bypass flow through said variable return flow orifices and across the ram for active damping control thereof.

11. A method of controlling a servo system including a fluid powered ram actuator having opposed pressure surfaces, a main control servo valve having valve means positionable therein to provide variable fluid pressure and return flow orifices for metering flow to and from the opposed pressure surfaces of the ram, and electro-mechanical means operative independently of fluid power to effect selective positioning of the valve means, said method comprising

(a) operating the system in a normal operational mode by

(i) connecting a source of high pressure fluid to the servo valve, and

(ii) utilizing the electro-mechanical means to selectively position the valve means for metered passage of such high pressure fluid to either pressure surface of the ram through the variable fluid pressure orifices and from the opposed pressure surface of the ram through the variable return flow orifices, for controlled actuation of the ram; and

(b) operating the system in a damping operational mode upon loss of such source of high pressure fluid by

(i) directing bypass fluid flow from either pressure surface of the ram to the other pressure surface through the same variable return flow orifices that are used in such normal operational mode, and

(ii) utilizing the electro-mechanical means to selectively modulate the valve means for regulated metering of such bypass fluid flow through such variable return flow orifices and across the ram for active damping control thereof.

4,555,975
HYDRAULIC STEERING

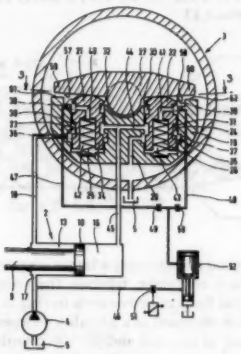
Armin Lang, Schwäbisch Gmünd, and Helmut Knödler, Lorch, both of Fed. Rep. of Germany, assignors to Zahnradfabrik Friedrichshafen, AG., Friedrichshafen, Fed. Rep. of Germany

Filed May 25, 1982, Ser. No. 381,708

Claims priority, application Fed. Rep. of Germany, Jun. 5, 1981, 3122368

Int. Cl.[4] F15B 15/17

U.S. Cl. 91—417 R 17 Claims



1. In a hydraulic system, a pump, a reservoir, a servomotor having a piston with opposed pressure surfaces, a control valve having two valve pistons respectively controlling two valve flow passages through which fluid from the pump is conducted to the servomotor and the reservoir, means for actuating the valve pistons, and feedback means exerting reaction forces on the valve pistons in response to actuation thereof for resisting valve displacement in directions opening the two valve flow passages, the improvement comprising spring means respectively biasing the valve pistons (21, 22) in directions closing the two valve flow passages (36, 37), and control passage means for controlling the reaction forces only on one of the valve pistons as a function of said displacement thereof in the opening direction,

said control passage means including separate conduits (47, 48) respectively connected by the two valve pistons to the feedback means, flow restricting means (49, 50, 51) operatively connecting the pump to said separate conduits for pressurization of the feedback means, and exhaust means (38, 39) opened in response to said closing of the valve flow passages for depressurizing the feedback means.

4,555,976
DEVICE FOR CONTROLLING A HYDROMOTOR

Hans Wölfges, Lohr, Fed. Rep. of Germany, assignor to Mannesmann Rexroth GmbH, Lohr, Fed. Rep. of Germany

Filed Jan. 20, 1983, Ser. No. 459,624

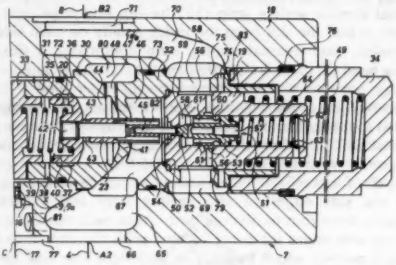
Claims priority, application Fed. Rep. of Germany, Jan. 20, 1982, 3201546

Int. Cl.[4] F15B 11/05

U.S. Cl. 91—420 8 Claims

1. Device for controlling a hydromotor, comprising a restricting control valve having connecting ports to a pressure source and to the hydromotor; a second control valve designed in the form of a releasable non-return valve; an actuating cylinder-and-piston unit associated with the second control valve and having a control piston dividing the cylinder of the unit into two control spaces, one of said control spaces housing a biasing spring for said piston and being provided with a first control port, the other control space being formed with a second control port, said second control valve including connecting ports leading, respectively to the hydromotor and to

the restricting control valve, a flow regulator having an outlet connected to the first control port of the cylinder-and-piston unit, and an inlet connected to the connecting port of the restricting control valve which leads to the hydromotor, the



outlet of said flow regulator and said first control port being connected via throttling means to a supply container, and the connecting port of the second control valve leading to the restricting control valve being further connected to the second control port of the cylinder-and-piston unit.

4,555,977

HYDRAULIC CONTROL CIRCUIT FOR CONTROLLING AND MONITORING OPERATING PRESSURE IN A HYDRAULIC CONSUMER DEVICE

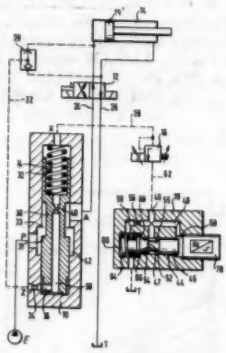
Helmut Motzer, Leinfelden-Echterdingen, Fed. Rep. of Germany, assignor to Herion-Werke KG, Fellbach, Fed. Rep. of Germany

Filed Aug. 29, 1983, Ser. No. 527,303

Claims priority, application Fed. Rep. of Germany, Sep. 1, 1982, 3232536

Int. Cl.⁴ F15B *11/08*

U.S. Cl. 91—446 **9 Claims**



1. An hydraulic control circuit for controlling and monitoring of an operating pressure of a pressure fluid in a hydraulically-operated consumer device, particularly for a tool chuck or head stock of a machine tool, comprising a pressure-reducing valve including an inlet connection to receive a pressure fluid from a pressure fluid source, a control connection connected to the consumer device, and a servo control connection; a servo valve connected to said servo control connection of the pressure-reducing valve to receive pressure fluid therefrom, said servo valve adjusting an operating pressure of said fluid to a desired value; and a pressure fluid flow monitoring device connected to said servo valve, said flow monitoring device including a contactless electrical switch operative for shutting off the consumer device, a displaceable valve piston having two opposite sides, and a spring, said valve piston being loaded at one side thereof with the pressure fluid flowing into the flow monitoring device directly from said servo valve and at the other side thereof being continually loaded with said spring, said displaceable valve piston being operative for switching on said switch to shut off said consumer device if the operating pressure in the consumer device falls below a value of the operating pressure adjusted in said servo value.

4,555,978

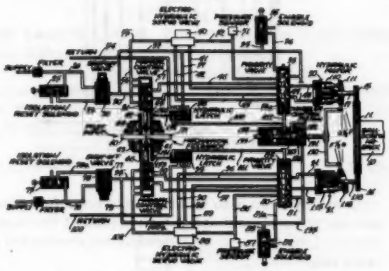
MULTIPLE DISPLACEMENT MOTOR DRIVEN POWER DRIVE UNIT

Wesley A. Burandt, and Allyn M. Aldrich, both of Rockford, Ill., assignors to Sundstrand Corporation, Rockford, Ill.

Filed Feb. 14, 1984, Ser. No. 580,074

Int. Cl.⁴ F01B *13/04;* **F16H** *37/06*

U.S. Cl. 91—506 **11 Claims**



1. A multiple displacement motor driven power drive unit utilizing a torque summing gear train having an output for driving a member and plural motor inputs and wherein the unit operates with the power efficiency of a velocity summing gear train driven by plural motors comprising, a pair of variable displacement hydraulic motors in separate independent hydraulic circuits and each connected to an input side of said torque summing gear train, each of said variable displacement hydraulic motors having an adjustable wobbler plate for setting motor displacement at or between zero and full displacement, interconnecting means fixing the relation between said wobbler plates whereby when one wobbler plate is at full displacement-setting position the other wobbler plate is at zero displacement-setting position, and means for establishing three different conditions of said interconnecting means wherein in two of said conditions one or the other of the wobbler plates is at full displacement-setting position and in the third condition both of the wobbler plates are positioned to set one-half of full displacement of the motors.

4,555,979

FLUID-POWERED MULTIPLE PISTONROD LIFT UNIT

Robert Cetnarowski, 6080 Maple La., Pearl Beach, Mich. 48052

Filed Aug. 6, 1984, Ser. No. 637,894

Int. Cl.⁴ F01B *11/02;* **F16J** *15/18*

U.S. Cl. 92—85 B **20 Claims**

1. A fluid-powered, multiple pistonrod lift unit telescopically extendable linearly along an axis and resistent to bending caused by transverse loads, comprising:

a tube having an internal axial cavity defined by a tube wall and a first and second end portion;

a piston sealingly cooperating with the tube wall and slideable along the axis thereof;

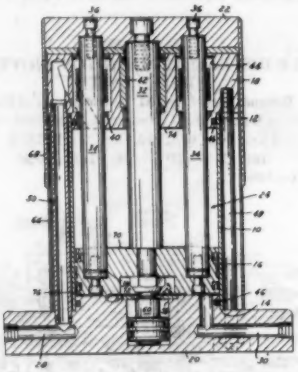
first sealing means cooperating with said first end of the tube establishing a first region bounded by said first sealing means, said piston and the tube wall;

a second sealing means cooperating with the second end of

the tube establishing a second region bounded by the second sealing means, said piston and the tube wall;

at least three piston rods parallel to said axis and not lying in a common plane each attached to said piston and slideably extending through at least one of said first and second sealing means; and

means to admit fluid into and out of at least one of said first and second regions in order to move the piston and piston-



rods axially relative to said tube between a first point and second point on said axis which represent the maximum travel of the piston in the extended and contracted directions respectively;

whereby said plurality of pistonrods prevent relative rotation between the piston and the tube and provide a rigid structure resistent to bending caused by said transverse loads.

4,555,980

SEALING DEVICE FOR A PRESSURE FLUID CYLINDER WITHOUT PISTON ROD

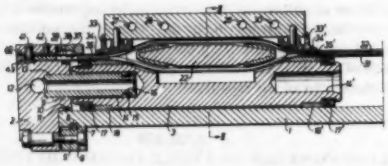
Ingolf Höglund, Huddinge, Sweden, assignor to AB Mecman, Stockholm, Sweden

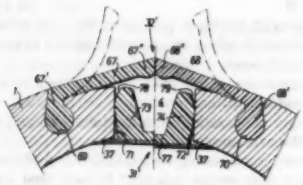
Filed Dec. 3, 1982, Ser. No. 446,577

Claims priority, application Sweden, Dec. 22, 1981, 8107724

Int. Cl.⁴ F01B *29/00*

U.S. Cl. 92—88 **4 Claims**





1. A sealing device for a pressure fluid cylinder without a piston rod and of the kind comprising a cylinder tube (1) having a longitudinal slot (4), end covers (2) closing the ends of said cylinder tube, a piston (3) axially movable in said cylinder tube, and operable by pressurized fluid, and a movement transfer device (19) connected to said piston extending substantially radially outwards through said slot, said device including an internal flexible sealing strip (31') having side edges and arranged to seal the slot from the inside axially on each side of the piston, said internal sealing strip comprising a flexible sealing band (37) which is wider than the slot and engages with its edge portions sealingly against the cylinder tube at each transversal side of the slot, and retention means (73, 74; 75, 76) secured to the sealing band extending into the slot between the side walls (71, 72) thereof and being in releasable mechanical engagement with said side walls, said retention means including a pair of legs affixed to said sealing strip at locations spaced from the side edges of said sealing strip and extending obliquely therefrom to diverge away from each other toward the strip side edges for being located with the slot, each leg having a portion which engages an associated side wall inside the slot and spaced inwardly of the strip side edges so that the outwardly directed legs engage the side walls at an angle for exerting a force against such associated side walls which increases as the sealing strip flexes into the slot under influence of pressure from within the cylinder tube.

4,555,981

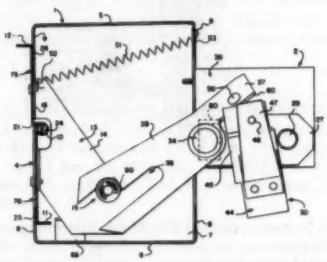
DAMPER OPERATOR FOR USE WITH AIR, SMOKE AND FIRE DAMPERS

Francis J. McCabe, 239 Hastings Ct., Doylestown, Pa. 18901

Continuation-in-part of Ser. No. 229,830, Jan. 30, 1981, Pat. No. 4,472,999, which is a continuation-in-part of Ser. No. 16,514, Mar. 1, 1979, Pat. No. 4,301,569, which is a continuation-in-part of Ser. No. 896,299, Apr. 14, 1978, Pat. No. 4,195,384, which is a continuation-in-part of Ser. No. 799,044, Mar. 18, 1977, Pat. No. 4,099,292, which is a continuation-in-part of Ser. No. 676,483, Apr. 13, 1976, Pat. No. 4,401,570, and a continuation-in-part of Ser. No. 676,413, Apr. 13, 1976, Pat. No. 4,040,304, and a continuation-in-part of Ser. No. 764,774, Feb. 2, 1977, Pat. No. 4,114,646, which is a continuation of Ser. No. 689,994, May 26, 1976, Pat. No. 4,081,173, said Ser. No. 16,514, is a continuation-in-part of Ser. No. 896,237, Apr. 14, 1978, Pat. No. 4,219,041, and a continuation-in-part of Ser. No. 905,211, May 12, 1978, Pat. No. 4,183,129, which is a division of Ser. No. 729,831, Oct. 4, 1976, Pat. No. 4,113,232. This application Aug. 10, 1984, Ser. No. 639,909

Int. Cl.⁴ F24F *7/00*

U.S. Cl. 98—1 **21 Claims**



20. For a damper having a frame, and a blade pivotally associated with the frame, an improved damper operator comprising:

a. drive means operatively associated with the frame of the damper;

b. a plurality of lever arms pivotally associated with each other and extending between the drive means and means for rotating the blade;

c. means for selectively interconnecting portions of each of

the lever arms to each other so that selective engagement between the portions of the lever arms permits selective respective rotation of the lever arms, to permit the blade to be urged to a selected orientation; and

d. means on one of said arms to selectively prevent counter-rotation of the blade once it has been rotated to a selected orientation.

4,555,982

ROOF VENTILATOR

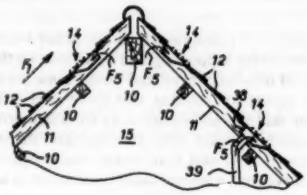
Michel Goubaud, 359 Bd Léon Séché 44150 Ancenis, France

Filed Feb. 7, 1984, Ser. No. 577,718

Claims priority, application France, Feb. 11, 1983, 83 02200

Int. Cl.⁴ F24F *7/02*

U.S. Cl. 98—42.22 **29 Claims**



1. A roof ventilator intended to be mounted in a sloping roof and having an upper end and a lower end, said ventilator comprising means defining an opening having an upper end and a lower end, a panel at least partially covering said opening, said panel having a plurality of pairs of transverse louvers defining louver openings, said louver openings being elongated and extending generally in the same direction as said upper and lower ends, alternate endmost ones of said louvers converging outwardly of said panel and the cross section of said louver openings being of outwardly tapering truncated configuration.

4,555,983

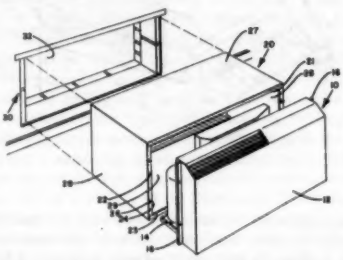
APPARATUS FOR SECURING AND SEALING A PACKAGED TERMINAL AIR CONDITIONER TO A PLASTIC WALL SLEEVE

Theodore S. Bolton, Liverpool, and Richard D. Lang, Chittenango, both of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Feb. 4, 1985, Ser. No. 698,193

Int. Cl.⁴ F24F *13/00*

U.S. Cl. 98—114 **6 Claims**



1. An apparatus for securing a packaged terminal air conditioning unit in a through-the-wall aperture comprising:

a sleeve adapted to be mounted in the through-the-wall aperture including top, bottom, and two side walls, at least two flanges extending perpendicularly inwardly from the front of two of said walls, and said flanges having a plurality of apertures therethrough and each aperture having a standoff means therearound extending toward the front of said walls and nut means around each of said apertures on said flange, and

a packaged terminal air conditioning unit assembly including a front panel and a chassis, said chassis adapted to be removably slidable into said sleeve and having a plurality of L-shaped mounting flanges extending perpendicularly outward from said chassis, said L-shaped mounting flanges having a plurality of apertures therethrough, each of said apertures in said L-shaped mounting flanges in spaced relation with said standoff means for receiving a fastener means first through said aperture in said L-shaped mounting flange, secondly through said standoff means and aperture in said flanges of said sleeve, and then through said nut means for moving said L-shaped mounting flange into contact with said standoff means whereby said standoff means in said sleeve is in compression.

4,555,984

COFFEE MAKER

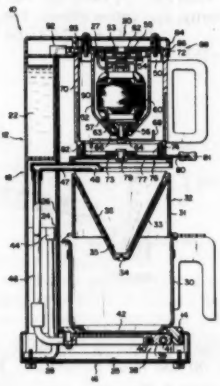
Kiyoshi Yamashita, Aichi, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed May 17, 1983, Ser. No. 495,490

Claims priority, application Japan, May 19, 1982, 57-85528; Sep. 2, 1982, 57-133485[U]; Sep. 16, 1982, 57-140347[U]; Oct. 9, 1982, 57-154242[U]; Nov. 29, 1982, 57-181147[U]

Int. Cl.⁴ A47J *31/42*

U.S. Cl. 99—286 **21 Claims**



1. A coffee maker comprising:

a main body having a base forming a jug stand, a straight portion extending vertically upwardly from said base, and a support portion extending from said straight portion and spaced apart from said base at a predetermined distance and substantially parallel to said base;

a jug for storing brewed coffee placed on said jug stand, said jug having substantially a cylindrical shape with bottom and top ends and a bottom wall at said bottom end;

an extractor placed over said jug and having an extractor main body of a substantially cylindrical shape with an upper and lower end and formed with an opening at said upper end thereof, said lower end of said extractor main body being supported on said top end of said jug;

a mill case for storing coffee beans having a substantially cylindrical shape with a first and second end, said first end being detachably mounted on said support portion and said second end being adjacent to and opposing said opening of said extractor main body;

a motor mounted on said support portion and housed in said mill case to define a milling space with the inner surface of said mill case;

a cutter arranged in said milling space and driven by said motor to grind coffee beans in said mill case, said mill case having a dispensing port facing said extractor through which the coffee ground in said mill case is supplied to said extractor;

a tank for storing water mounted in said main body; and

hot water supply means, disposed in said main body, for heating water in said water tank and for supplying hot water to said extractor,

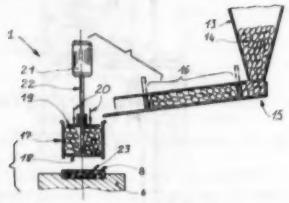
wherein said mill case, said extractor and said jug are vertically aligned to be coaxial with each other; and wherein said mill case and said support portion have mounting means for detachably mounting said first end of said mill case on said support portion, said mounting means having a plurality of projections formed on the outer surface at said first end portion of said mill case to be spaced apart from each other, and a plurality of elongated holes which respectively engage said plurality of projections.

4,555,985

MACHINE FOR PREPARING CULINARY SPECIALTIES IN THE FORM OF FLAT CAKES

Denis Pacquet, 17 bis Place du Gal de Gaulle, 59122 Houschoote, France

Filed Jan. 23, 1984, Ser. No. 573,206
Claims priority, application France, Feb. 4, 1983, 83 01987
Int. Cl.⁴ A47J *37/04*
U.S. Cl. 99—353 **16 Claims**



1. A machine for preparing culinary specialities in the form of flat cakes (8) and more particularly, but not exclusively, cakes made from a previously grated product (14) such as potato cakes (8), the machine for producing each cake (8) comprising a plate (6) having a recess formed therein and means for conducting this plate successively to a plurality of stations (1 to 5), said stations comprising:

a first station (1) for supplying the recess (7) with products (14, 24, 25) required for cooking and/or entering into the composition of the cake to be produced,

a second station (2) having a cooking zone for cooking a first face of the cake,

a third station (3) for turning the cake over,

a fourth station (4) having a cooking zone for cooking a second opposite face of the cake, and

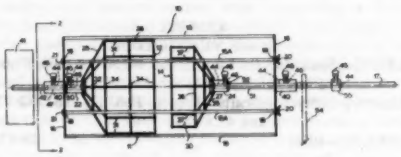
a fifth station (5) for discharging the cake, the machine being characterized in that the plate follows travel paths forming a closed circuit (9) that is rectangular in shape, the travel paths to the second and fourth stations (2 and 4) for cooking the two faces of the cake (8) being disposed parallel and at a small distance from each other and also to extend in opposite directions, and in that between the paths junctions are provided at a front of the machine by the first and fifth stations and at the rear of the machine by the third station.

4,555,986

CAGE ROTISSERIE

Morris L. Eisenberg, Lee, Mass., assignor to Robert F. Cimini, Lee, Mass., a part interest

Filed Mar. 15, 1984, Ser. No. 589,748
Int. Cl.⁴ A47J *37/04*
U.S. Cl. 99—427 **16 Claims**



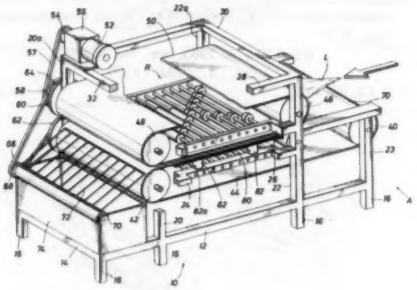
1. An improved rotisserie which comprises a drive stud, an end rod, means for supporting said drive stud so that said end rod is spaced from said drive stud on the same horizontal axis, and drive means for rotating said drive stud, a first basket centered on said axis and facing away from said drive stud and firmly connected to said drive stud to rotate therewith about said horizontal axis, said first basket being supported solely from said drive stud, a second basket connected to said end rod which is centered on said axis and facing toward said drive stud, said second basket being supported solely from said end rod, said baskets being constructed of metal wire and so configured that the open face of one basket may be received telescopically within the open face of the other and at least one of said baskets is selectively movable while centered on said axis towards the other said basket so that said two baskets can graspingly receive and hold meat between them.

4,555,987

METHOD AND APPARATUS FOR EXTRACTION OF ALOE VERA GEL

Larry N. Tumlinson, 826 W. 22nd St., Mission, Tex. 78572

Filed Jul. 22, 1983, Ser. No. 516,299
Int. Cl.⁴ B30B *9/20, 9/24*
U.S. Cl. 100—118 **7 Claims**



1. Apparatus for extraction of aloe vera gel from harvested leaves of the aloe vera plant, each of the aloe vera leaves having a relatively soft gel filled core surrounded by a dense outer peel covering with a layer of aloin disposed between the core and the rind, said apparatus including:

a support frame formed of sufficient strength and rigidity to maintain the apparatus in operating relationship;

a first pair of belt drums rotatably mounted with said support frame, said first pair of belt drums spaced apart a prearranged distance;

a first endless belt disposed about said first pair of belt drums;

means for rotating at least one of said first pair of belt drums for continuously moving said first endless conveyor belt;

a plurality of rollers for supporting a portion of said moving endless belt between said belt drums;

means mounted with said support frame for continuously urging said plurality of rollers for limited movement toward the supported portion of said endless belt;

an upper plurality of rollers arranged in a predetermined pattern opposite said lower plurality of rollers for crushing the aloe vera leaves against the portion of the first endless belt supported by the opposing plurality of rollers to extrude the aloe vera gel from the core of the leaves;

a drainage grate disposed adjacent one of the belt drums of said first pair of belt drums to enable the crushed aloe vera leaves to move from the endless belt to the drainage grate, said drainage grate arranged to support the crushed leaves thereon during the time while the aloe vera gel flows from the crushed leaves and to remove the crushed leaves from the drainage grate prior to the aloin extruding from the crushed leaf to prevent contamination of the aloe vera gel with the aloin; and

a receiver disposed below said drainage grate for receiving and containing the gravity flow of aloe vera gel from the crushed leaves.

4,555,988

DEVICE FOR APPLYING SURFACE PRESSURE TO ADVANCING WORKPIECES

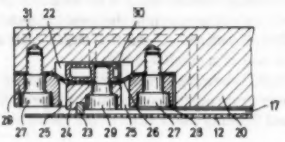
Werner Pankoke, Bielefeld, Fed. Rep. of Germany, assignor to Firma Theodor Hymmen KG, Bielefeld, Fed. Rep. of Germany

Filed Mar. 23, 1984, Ser. No. 592,683

Claims priority, application Fed. Rep. of Germany, Mar. 24, 1983, 3310700

Int. Cl.⁴ B30B *5/06*

U.S. Cl. 100—154 **10 Claims**



1. In a device for applying surface pressure to workpieces advancing on at least one movable compression belt having means for forcing the belt against the workpiece including means forming a first pressure chamber adjacent to the belt and receptive of a pressure medium including a compression plate and a continuous sealing strip between the compression plate and belt for sealing off the first pressure chamber, the improvement comprising means mounting the sealing strip to the compression plate comprising an elongated diaphragm disposed around the edge of the first pressure chamber, means attaching the sealing strip to a surface of the diaphragm facing the belt, means forming a second pressure chamber between the compression plate and the diaphragm and receptive of a pressure medium and including means connecting the edges of the diaphragm to the compression plate for sealing off the second pressure chamber from the first pressure chamber to form an additional elastic seal, with the surface of the diaphragm facing away from the sealing strip being subjected to the pressure medium, whereby the compression force between the sealing strip and the belt can be increased by the pressure medium in the second pressure chamber to prevent the escape of pressure medium from the first pressure chamber.

4,555,989

APPARATUS FOR WASHING A RUBBER BLANKET CYLINDER OF A PRINTING MACHINE

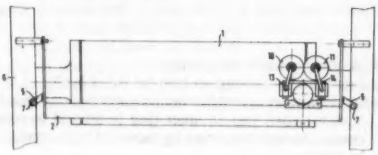
Josef Marass, Seehausen, and Rudolf Liepert, Augsburg, both of Fed. Rep. of Germany, assignors to Georg Spiess GmbH, Gersthofen, Fed. Rep. of Germany

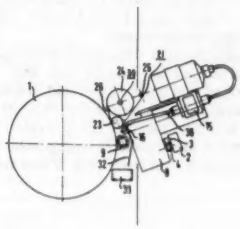
Filed Mar. 2, 1984, Ser. No. 585,821

Claims priority, application Fed. Rep. of Germany, Mar. 14, 1983, 3308980

Int. Cl.⁴ B41F *35/02;* **B41L** *41/02*

U.S. Cl. 101—424 **6 Claims**





1. Washing apparatus for a rubber blanket cylinder of a printing machine comprising:

a cleaning cloth having a width which is a fraction of the width of the rubber blanket cylinder;

a supply roller for said cleaning cloth;

a supply shaft for supporting said supply roller;

a take-up roller for said cleaning cloth;

a take-up shaft for supporting said take-up roller, said supply shaft and said take-up shaft both being axially stepped, said supply roller and said take-up roller being fixed on their respective supply and take-up shafts by sleeves engageable with reduced portions of said respective supply and take-up shafts;

means for pressing said cleaning cloth against the rubber blanket cylinder, said pressing means comprising a rotating guide roller over which the cleaning cloth is guided;

means for controlling and driving said cleaning cloth take-up roller for incremental take-up of constant lengths of cleaning cloth;

a rotatable brush roller disposed in contact with the rubber blanket cylinder and on a side of said pressing means wherein the rubber blanket cylinder contacts said brush roller prior to said pressing means when the rubber blanket cylinder is rotating;

means for supplying a cleaning liquid to said brush roller;

means for supplying water to said brush roller;

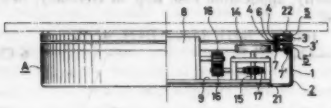
means for guiding and moving said washing apparatus across the width of the rubber blanket cylinder from a starting position to a second position and back to said starting position; and

means for rotating said brush roller in a first direction as said washing apparatus is moved from said starting position to said second position and for rotating said brush roller in a second direction opposite of said first direction as said washing apparatus is moved from said second position to said starting position.

4,555,990
ROTARY BOARD

Kinsho Egawa, Miyagi, Japan, assignor to Genroku Corporation, Japan

Filed May 29, 1984, Ser. No. 614,801
Int. Cl.[4] A47B *11/00*
U.S. Cl. 108—20 4 Claims

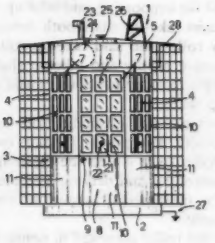


1. A rotary board comprising:
a base member having an annular outer wall;
a first ball bearing unit having an outer ring mounted on said base member, and an inner ring permitted to rotate with respect to said outer ring by means of balls confined therebetween;
a second ball bearing unit having an inner ring coaxially mounted to said inner ring of said first ball bearing unit, and an outer ring permitted to rotate with respect to said inner ring of said second ball bearing unit by means of balls confined therebetween;
a circular board member detachably mounted on said outer ring of said second ball bearing unit; and
means for driving said inner ring of said first ball bearing unit to rotate, comprising a motor driven shaft rotatably supported on said base member and provided with a friction surface thereon maintained in engagement with the inner annular surface of said inner ring of said first ball bearing unit.

4,555,991
GUARD-HOUSE OF IMPROVED TYPE

Gianfranco Bellezza, Turin, Italy, assignor to C.P.M. S.p.A. Impianti Industriali, Turin, Italy

Filed Jan. 5, 1984, Ser. No. 568,366
Claims priority, application Italy, Jan. 11, 1983, 52826/83[U]
Int. Cl.[4] E04H *1/12, 3/08*
U.S. Cl. 109—9 11 Claims

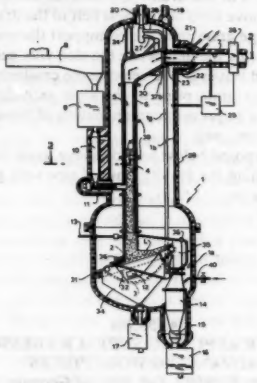


1. An armoured guard-house (1,30) for protecting guards, of the type comprising a base (2), a lateral armoured envelope (3) provided with at least one glazed observation area (4) protected by bullet-proof glass, and an upper closure canopy (5) characterised by the fact that the said glazed area (4) includes, in combination, an opaque armoured supporting framework (10) formed as a grid and sub-divided into a plurality of compartments (13) each delimiting a window (14) of relatively small dimensions with respect to those of the said glazed area (4), and a plurality of window panes (15) made of bullet-proof glass and each of which can be lodged in one of the said compartments (13) of the said framework (10) for closing the associated said window (14), each said window pane (15) having a reflecting surface (16) facing outwardly of the guard-house (1) in such a way that the guards housed within the interior of the said guard-house (1) can see the surrounding environment through the said glazed area (4) whilst an observer outside the said guard-house (1) cannot see through the said glazed area (4).

4,555,992
COAL GASIFICATION INSTALLATION

Jacques Dutu, Presles, and Paul Cosar, Paris, both of France, assignors to Fives-Cail Babcock, Paris, France

Filed Aug. 13, 1984, Ser. No. 640,328
Claims priority, application France, Aug. 31, 1983, 83 13961
Int. Cl.[4] F23G *5/00*
U.S. Cl. 110—229 14 Claims



1. An installation for gasifying coal in a fluidized bed under high pressure, which comprises
(a) a vessel having walls resistant to the high pressure and defining an interior,
(b) a reactor disposed in the interior and having a principal walled chamber constituting a gasification chamber having a bottom and permitting the establishment of a principal fluidized bed of substantial depth and an auxiliary fluidized bed of a smaller depth,
(c) an inclined traveling grate, the grate having
(1) a lower grate portion supporting the principal fluidized bed and forming the bottom of the gasification chamber, and
(2) an upper grate portion supporting the auxiliary bed situated in a space between the vessel walls and the gasification chamber, and
(d) means for maintaining the principal and auxiliary fluidized beds in hydrostatic equilibrium.

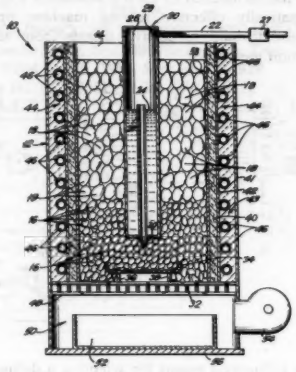
4,555,993
WATER GAS FURNACE

Carmelo Gallaro, 490 Henry St., Brooklyn, N.Y. 11231

Filed Jun. 11, 1984, Ser. No. 619,473
Int. Cl.[4] F23B *7/00*
U.S. Cl. 110—234 12 Claims

1. A water gas furnace comprising:
a containment vessel defining an outer chamber for housing a layer of carbonaceous material;
an inner chamber disposed within said containment vessel and extending into said layer;
inlet means coupled to said inner chamber for supplying a flow of water to said inner chamber;
outlet means coupled to said inner chamber for supplying steam into the outer chamber, the steam resulting from heating the water in the inner chamber through combustion of the carbonaceous material;

air supply means coupled to said outer chamber so that a combination of the steam and air in the combustion of the carbonaceous material produces oxygen and hydrogen gases to define a water gas which ignites and continues to heat the furnace; and



iron means to provide a catalyst for disassociation of the oxygen and hydrogen gases, said iron means absorbing the oxygen gas to free the hydrogen gas to burn as a fuel within the furnace;

said iron means including a cylinder of sheet steel disposed about said layer of carbonaceous material.

4,555,994

BOILER-HEATING ASSEMBLY WITH OIL- AND COAL-FIRED IGNITION BURNERS

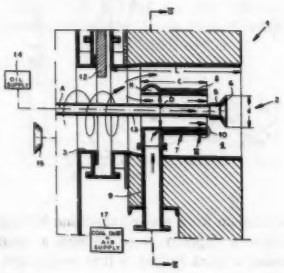
Karl Voigt, Cologne; Jürgen Kamm, Jüchen, and John Norbert, Berheim, all of Fed. Rep. of Germany, assignors to Rheinisch-Westfalisches Elektrizitatswerk AG, Essen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 558,997, Dec. 7, 1983, abandoned, which is a continuation-in-part of Ser. No. 418,585, Sep. 15, 1982, abandoned. This application Aug. 6, 1984, Ser. No. 638,225

Claims priority, application Fed. Rep. of Germany, Oct. 14, 1981, 3140798

Int. Cl.⁴ F22G *5/00;* **F22B** *37/42*

U.S. Cl. 110—261 **1 Claim**



1. In a plant having a power-generating boiler heated by at least one main burner associated with an ignition burner, the improvement wherein said ignition burner comprises:

a burner housing defining a generally cylindrical chamber with a peripheral wall centered on an axis and with wide-open upstream and downstream ends;

blower means for generating an axial air flow passing through said chamber from the upstream end to the downstream end thereof;

an axially disposed igniter pipe in said chamber terminating in an oil nozzle in the vicinity of said downstream end;

first supply means for feeding fuel oil via said igniter pipe to the oil nozzle with formation of an oil spray emitted therefrom;

a tubular, generally cylindrical and double-walled powder nozzle spacedly centered on said igniter pipe ahead of the oil nozzle, said powder nozzle dividing said axial air flow into an outer and an inner air stream, the walls of said powder nozzle defining an interspace with an annular outlet open toward said downstream end, the oil nozzle carrying downstream of said outlet a stationary annular baffle with a solid frustoconical rear surface projecting into the path of said inner air stream;

second supply means including a source of powdered lignite for feeding a mixture of powdered coal and air tangentially into said interspace at an entrance manifold closed to the outside and for generating a rotating annular stream of said mixture emitted by said outlet, said annular baffle having an outer diameter close to the inner diameter of said powder nozzle for deflecting said inner air stream radially outward into the path of said annular stream, said powder nozzle having an outer wall with an outwardly flared inner surface at said outlet and an axial length which is substantially two-thirds that of said chamber, said oil nozzle being retractable together with said annular baffle through said powder nozzle; and

shutter means disposed ahead of said powder nozzle at the upstream end of said chamber and operable to block the air flow through said chamber, said oil nozzle having an oil-burning capacity accounting for a maximum of about 5% of the heat output of said ignition burner, said boiler being disposed in a space bounded by four vertical walls, said main burner and said ignition burner being part of an assembly of burners duplicated on each of said vertical walls, each of said vertical walls being provided with a pair of ignition burners and with two associated main burners respectively disposed at a higher and at a lower level.

4,555,995

THERMAL INSULATION OF INDUSTRIAL FURNACE CROWNS

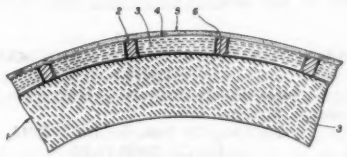
Stoyan S. Lyutzkanov, Sofia, and Dimiter K. Bojkov, Plovdiv, both of Bulgaria, assignors to Stopansko Obedinenie "Quarz", Sofia, Bulgaria

Filed May 22, 1984, Ser. No. 612,851

Claims priority, application Bulgaria, Jun. 30, 1983, 61536

Int. Cl.⁴ F23M *5/06*

U.S. Cl. 110—335 **3 Claims**



1. Thermal insulation for crowns and other industrial furnace parts having a surface to insulation, comprising a reinforcing lattice on such surface, the lattice being made of sectors which are filled by refractory insulation material, with an adhesive protection layer applied over the sectors; refractory insulation material and the adhesive protection layer being hardenable under the affect of the heat radiated from the furnace, the refractory insulation material containing the following components in weight parts:

refractory ball clay: 20–35

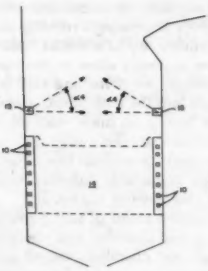
quartz sand: 2–25
alumino-phosphate bond: 10–20
water: 25–40
burning organic additives: 120–150 volumes
parts, compared with on the basis of 100 parts by volume of the mixture of the remaining components.

4,555,996

METHOD FOR REDUCTION OF SULFUR PRODUCTS IN THE EXHAUST GASES OF A COMBUSTION CHAMBER

Tsvetan I. Torbov, Sunnyvale; George R. Offen, Woodside, both of Calif., and Stuart K. Denike, Scottsdale, Ariz., assignors to Acurex Corp., Mountain View, Calif.

Filed Jul. 6, 1984, Ser. No. 628,456
Int. Cl.[4] F23J *11/00, 15/00*
U.S. Cl. 110—345 **3 Claims**



1. A process for reducing the sulfur content of flue gas from a combustion installation comprising the step of injecting an aqueous spray composition, said composition providing a solid capable, after evaporation of water, of reacting with sulfur-containing gases, into a first zone outside of the combustion region of said combustion installation such that said spray composition is exposed to temperatures exceeding about 2200° F.

whereby said spray composition is injected at such a location, velocity, and liquid droplet size that it remains substantially aqueous as it disperses within gases resulting from combustion and flows with said gases while water in said composition evaporates, to a second zone having an upper temperature limit of about 2200° F., thereby providing a substantial portion of said composition as solid particles uniformly mixed with the combustion gases within said second zone, which particles are capable of binding sulfur species in the product of combustion gases, wherein said solid particles comprise calcium carbonate, magnesium carbonate, calcium hydroxide, magnesium hydroxide, or mixtures thereof.

4,555,997

SEMI-AUTOMATIC SEWING MACHINE CONTROL SYSTEM

Tibor L. Tancs, Roselle Park, N.J., assignor to The Singer Company, Stamford, Conn.

Filed May 29, 1984, Ser. No. 615,013
Int. Cl.[4] D05B *19/00*
U.S. Cl. 112—121.11 **5 Claims**

1. In a sewing machine for performing a sewing operation involving a series of seam segments and having a reciprocatable needle for stitching material advanced in a feed direction, drive means for operating said sewing machine, and an operator influenced control for said drive means,

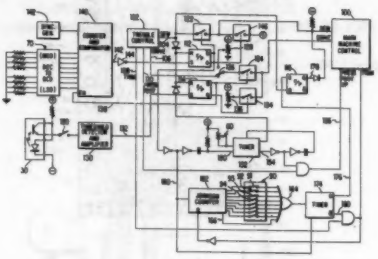
the improvement which comprises

material detection means mounted in front of said needle in the material feed direction for generating a signal in response to any change in the number of plies of material being advanced in the feed direction,

a first and a second means associated with said sewing machine each providing for a different automatically effective sewing machine operation,

means responsive to successive signals from said material detection means for initiating actuations of said first of said automatically effective sewing machine operations,

counter means indexed by each actuation of said first of said automatically effective sewing machine operations in response to said successive signals from said material detection means,



operator influenced means for selecting a defined count of said counter means,

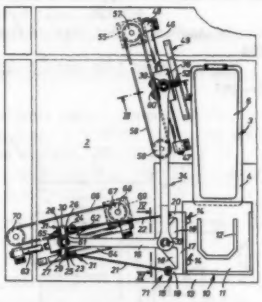
and means effective after attainment of said defined count of said counter means for initiating actuation of said second of said automatically effective sewing machine operations in response to the next signal from said material detection means.

4,555,998

SEWING MACHINE FEED MECHANISM

August Martin, Morbach, Fed. Rep. of Germany, assignor to Pfaff Industriemaschinen GmbH, Fed. Rep. of Germany

Filed Feb. 27, 1985, Ser. No. 706,023
Claims priority, application Fed. Rep. of Germany, Feb. 29, 1984, 3407338
Int. Cl.[4] D05B *21/00, 27/00*
U.S. Cl. 112—121.12 **6 Claims**



1. A feed mechanism for a sewing machine having a needle reciprocating over a support along which a workpiece is moved, comprising a work holder, a first swing arm having a center arm with a pivotal end and an opposite end, a transversely extending cross bar extending outwardly from each side of said opposite end and engageable with said work holder, a second swing arm having a first pivotal end and a second pivotal end opposite to said first pivotal end connected to said center arm adjacent said center arm opposite end, a first slide pivotally supporting said pivotal end of said first swing arm, a second slide pivotally supporting said first pivotal end of said second swing arm, a spring strip extending between re-

spective ends of said cross bar and the end of said center arm adjacent said pivotal end, and means for moving said first and second slides including a respective fixed stepping motor for each slide.

4,555,999

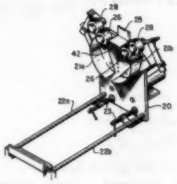
WAISTBAND INDEXING METHOD AND APPARATUS

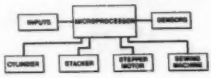
William R. Conner, P.O. Box 288, Shelbyville, Tenn. 37160

Filed Apr. 9, 1984, Ser. No. 597,920

Int. Cl.[4] D05B *19/00, 97/00, 3/12*

U.S. Cl. 112—121.27 **13 Claims**





4. Apparatus for indexing the waistband of trousers for sewing thereto at a stitching station belt loops at a series of waistband positions comprising, in combination, drive means for reversibly driving a waistband through the stitching station, means for sensing an end of the waistband as it is driven by said drive means from a preselected position with respect to the stitching station, means for measuring the distance of waistband travel when driven by said drive means and for deriving therefrom the length of the waistband, means for determining a series of linearly spaced positions along the waistband from a preselected series of proportionally spaced locations and the derived waistband length, and drive control means for incrementally causing said drive means to drive the waistband to the positions in said series of linearly spaced determined positions.

4,556,000

NEEDLE STRUCTURE FOR TUFTING MACHINE

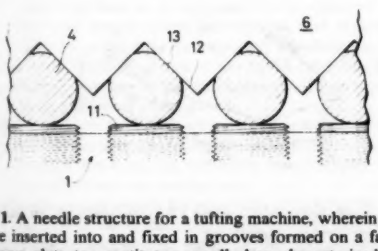
Yoshiharu Kurata, Mie, Japan, assignor to Nakacawa Seisakusho Co., Ltd., Agei, Japan

Filed Mar. 1, 1984, Ser. No. 585,133

Claims priority, application Japan, Mar. 8, 1983, 58-33259[U]

Int. Cl.[4] D05B *85/00*

U.S. Cl. 112—222 **3 Claims**



1. A needle structure for a tufting machine, wherein needles are inserted into and fixed in grooves formed on a face of a gauge plate to constitute a needle bar, characterized in that each of the needles provies at the base portion of the needle shaft with at least one chamfered portion which is brought into contact in a face-to-face relationship with one of the faces of the groove which is formed in the gauge plate for receiving the corresponding base portion of the needle shaft, wherein said gauge plate has angled grooves which are formed at an interval corresponding to the pitch of needles to be inserted therein and to constitute the needle bar, and wherein each of said angled grooves has a V-shaped section, and wherein one chamfered portion is formed on the base portion of the needle shaft and is brought into contact with one of the faces of the V-shaped groove.

4,556,001

SEWING MACHINE CONTROLLING APPARATUS

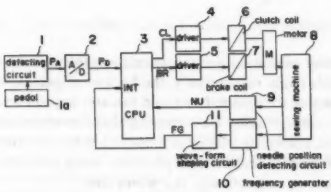
Shigeo Neki, Osaka; Nozomu Shinozaki, and Takeshi Morofuji, both of Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kodoma, Japan

Filed Mar. 29, 1983, Ser. No. 479,978

Claims priority, application Japan, Apr. 2, 1982, 57-55804; Apr. 2, 1982, 57-55805

Int. Cl.[4] D05B *69/18;* **H02P** *5/04*

U.S. Cl. 112—277 **2 Claims**



1. A sewing machine controlling apparatus, comprising an adjusting means for setting a machine speed, a set position detecting means for converting the position of said adjusting means into a set position signal P_D which is a digital value, a speed converting means for converting said set position signal into a speed setting signal S, a motor whose speed is controlled in a step by step fashion in accordance with said speed setting signal S, a sewing machine to be mechanically driven by said motor, a controlling means for controlling the machine, a timer, wherein said apparatus shifts from a speed setting signal S_1 which corresponds to an arbitrarily set position signal P_{D1} to speed setting signal S_2 which corresponds to another arbitrarily set position signal P_{D2} only after the lapse of a time period T, said time period T being measured by said timer.

4,556,002

BUOYANT PLANT ESPECIALLY FOR THE OFF-SHORE MANUFACTURING OF CONCRETE STRUCTURES

Hans C. Georgii, Rindögatan 42, S-115 35 Stockholm, Sweden

Filed Apr. 27, 1983, Ser. No. 489,117

Claims priority, application United Kingdom, Apr. 27, 1982, 8212106

Int. Cl.[4] B63B *35/44*

U.S. Cl. 114—264 **20 Claims**

1. A buoyant plant preferably for the off-shore manufacture of concrete structures, e.g., oil platforms, said plant comprising:

two substantially parallel, spaced, elongated side sections;

one of said side sections including a docking unit for receiving ships and the like;

port means provided in said docking unit which can be opened and closed to enclose completely a ship in said side section during a docking operation;

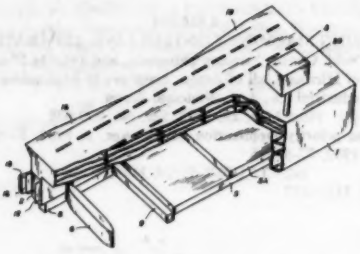
a roof section extending from the forward to the backward ends of said sections and connecting the top of said side sections to each other;

a stem section connected to the forward ends of said side and roof sections;

a substantially rectangular bottom section, the forward short side end of which is connected to said stem section and the backward short side end of which is situated spaced apart

forwardly of the backward ends of said side sections, said bottom section being connected along its long side ends to the lower parts of said side section;

a buoyant stern section situated, and connectable and disconnectable, respectively, in the opening between said roof and said side sections, said stern section extending from the inner face of one said side section to the other,



whereby said stern section is connectable to and disconnectable from, respectively, the backward part of said side sections at a distance from said bottom section to leave a downwardly facing free opening therebetween; and

a separate extending platform provided at the backward end of said bottom section, said platform being movable above and below, respectively, the water line.

4,556,003

SAILBOARD AND A PROCESS FOR PRODUCING THE SAME

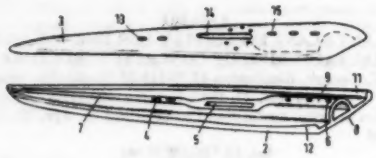
Ernstfried Prade, Weilheim, Fed. Rep. of Germany, assignor to Mistral Windsurfing AG, Bassersdorf, Switzerland

Continuation of Ser. No. 360,693, Mar. 22, 1982, abandoned. This application Aug. 7, 1984, Ser. No. 639,515

Claims priority, application Fed. Rep. of Germany, Mar. 26, 1981, 3112015

Int. Cl.[4] B63H *9/06*

U.S. Cl. 114—39 **21 Claims**



1. In a sailboard having a board body of synthetic resin and synthetic resin foam and fittings joined to the board body, said board body comprising:

a one piece lower part having a hard outer face and being in the form of a generally stiff base element of a material with a high mechanical strength, the fittings being joined to the base element such that all mechanical forces thereof are taken up by the base element; and

a top part engageable with said lower part and being composed of a flexible, light-weight synthetic resin material such that said top part presents an upper exposed surface of said flexible, light-weight resin material said top part having most of the buoyancy of the sailboard compared with the lower part said lower part being generally less buoyant.

4,556,004

FLOATING DEVICE FOR HOISTING AND TRANSPORTING LOADS

Jacques E. Lamy, Fontenay-aux-Roses, and Francisco de Asis M. Serrano, Issy-les-Moulineaux, both of France, assignors to Compagnie Generale pour les Developpements Operationnels des Richesses sous-Marines "C.G. Doris", France

PCT No. PCT/FR82/00166, § 371 Date Jun. 1, 1983, § 102(e) Date Jun. 1, 1983, PCT Pub. No. WO83/01235, PCT Pub. Date Apr. 14, 1983

PCT Filed Oct. 12, 1982, Ser. No. 503,158

Claims priority, application France, Oct. 12, 1981, 81 19164

Int. Cl.[4] B63B *25/00*

U.S. Cl. 114—61 **9 Claims**

1. A load lifting and transport device with adjustable buoyancy for operations at sea, for lifting and transporting a fully equipped deck having legs for supporting the deck on a marine platform, said device comprising:

two parallel groups of floats, each group having a horizontal float and vertical floats fixed by one of their ends to the horizontal float, the other ends of the vertical floats being fixed to longitudinal beams, one end of one group being connected to one end of the other group by a transverse horizontal float and a distance element;

a plurality of supporting beams transversely mounted on the longitudinal beams, said supporting beams movable along the longitudinal beams and having an end movable toward and away from the longitudinal axis of the transport device for cooperating with the load to lift it; and

means mounted on the legs of the deck for engaging with the ends of the movable supporting beams.

4,556,005

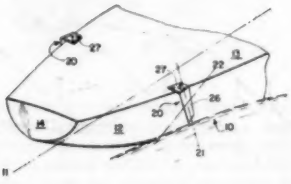
BOAT WITH AUXILIARY STEERING APPARATUS

Gregg B. Jackson, 721 Upshur St. NW., Washington, D.C. 20011

Filed Nov. 28, 1984, Ser. No. 675,611

Int. Cl.[4] B63H *25/00*

U.S. Cl. 114—146 **16 Claims**



1. In a water-borne boat having a longitudinal axis, an auxiliary steering device, comprising:

at least one fin connected to the aft half of said boat transversely from said longitudinal axis;

said fin having a cordwise axis that angles inward toward said longitudinal axis as said cordwise axis projects forward;

said fin having a spanwise axis with a generally vertical disposition when said boat is upright;

said fin being disposed so that at least part of it is close to said boat and all of it is out of the water when said boat is upright in a flat sea; and

said fin being sized, shaped, and positioned so that said fin is generally out of the water until said boat is so heeled as to have an undesired amount of helm, and after that, said fin, when connected to the heeled-down side of said boat, becomes progressively more immersed with further heeling of said boat, until fully immersed, relieving part but not all of the helm experienced by said boat when heeled down on that side.

4,556,006

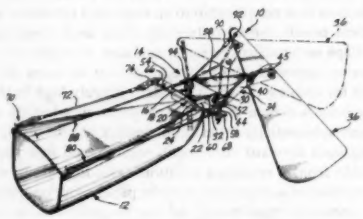
KAYAK STEERING SYSTEM

Peter H. Kaupat, 10013 - 51st Ave. SW., Seattle, Wash. 98146

Filed Jun. 24, 1983, Ser. No. 507,782

Int. Cl.[4] B63H *25/38*

U.S. Cl. 114—162 **12 Claims**



3. A steering system for a kayak which includes a stern and a cockpit spaced forwardly of the stern, said steering system comprising:

a rudder;

a steering and mounting means for the rudder including a tiller, means mounting a tiller onto the stern of the kayak, for pivotal movement about a generally vertical axis, and frame means extending rearwardly from the tiller to the rudder;

a biasing line having an after end connected to the first side of the tiller on a first side of a pivot axis, said biasing line extending forwardly from the tiller to a forward end, said biasing line including an elastomeric section;

first anchor means for attaching a forward end of the biasing line to the kayak, said first anchor means comprising an adjustable fastener in easy reach of the hand of a kayak operator located within said cockpit, said adjustable fastener being operable for adjustably attaching the forward end of the biasing line to the kayak, said line being attached to normally bias the rudder at an angle towards the biasing line side of the kayak;

a control line having an after end connectable to a second side of the tiller on the opposite side of the pivot axis, said control line extending forwardly from the tiller and having a forward end portion; and

second anchor means for adjustably attaching the forward portion of the control line to the kayak in easy reach of a hand of an operator seated in the cockpit, so that the operator can, with one hand, detach the control line from the kayak, pull on or relax the control line to cause movement of the rudder, and then reattach the control line to the kayak, for setting the position of the rudder.

4,556,007

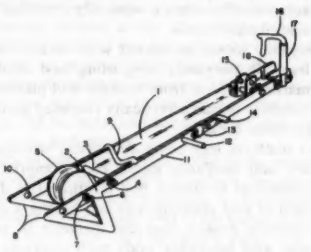
ANCHOR BOOM ASSEMBLY

Thomas Y. Awalt, Jr., Pensacola, Fla., assignor to Deep Seven Co., Pensacola, Fla.

Filed May 9, 1984, Ser. No. 608,430

Int. Cl.[4] B63B *21/22*

U.S. Cl. 114—210 **8 Claims**



1. An anchor handling boom assembly comprising in combination

(a) an elongated boom having a mount portion and a cantilever portion;

(b) mounting means for the boom whereby the mount portion can be affixed to the deck of a vessel and the cantilever portion can be cantilevered to overhang the bow or side of the vessel, so as to provide a loading outboard end of the cantilever portion;

(c) a shank guide assembly comprising in combination an elongated frame, a primary roller and fairlead means on one end of the frame, a fixed operating arm extending substantially parallel to the frame away from the other end of the frame to a control force application point near the end of the operating arm opposite the frame and a shank guide dip compensating means between the operating arm and the primary roller, the distance (d_2+d_3) between the primary roller and the compensating means being substantially less than the length of the boom (db);

(d) axial mounting means for mounting the guide assembly on the leading outboard end of the cantilever portion, the mounting means located on the guide member, so that the distance (d_1) between the control force application point and the axial mounting means is greater than twice the distance (d_2) between the primary roller and the axial mounting means;

(e) self-actuating means for locking the guide assembly in a position substantially parallel to and with a portion of the guide assembly substantially coextensive with the boom at a point on the guide member where the distance (d_4) between the locking means and the axial mounting means is more than twice the distance (d_2) between the axial mounting means and the primary roller and for unlocking and releasing the guide member so as to permit rotation of the shank guide assembly.

4,556,008

SEMI-SUBMERSIBLE MARINE PLATFORM

Alexander G. Copson, London, England, assignor to Adragem Limited, London, England

Filed Jun. 17, 1982, Ser. No. 389,248

Claims priority, application United Kingdom, Jun. 22, 1981, 8119159; Mar. 31, 1982, 8209413

Int. Cl.[4] B63B *35/44*

U.S. Cl. 114—265 **4 Claims**

1. A semi-submersible marine platform operable to be floatingly stationed upon and partially submerged within a body of water with enhanced payload capacity and stability, said semi-submersible platform comprising:

a platform deck generally horizontally extending above the surface of the body of water;

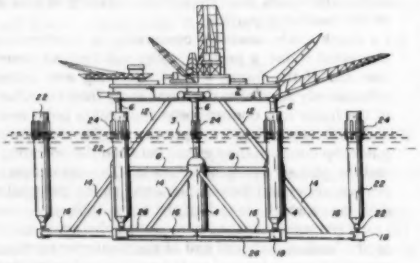
support means for maintaining said platform deck above the surface of the body of water and extending downwardly from the deck and into the body of water, said support means including,

platform legs extending generally vertically downwardly from said deck wherein central longitudinal axes of said plurality of platform legs are mutually parallel and substantially within a vertically extended perimeter of said platform deck,

buoyancy means associated with each of said platform legs for buoyantly supporting said semi-submersible marine platform from beneath said platform deck substantially within a vertically extended perimeter of said platform deck,

said platform legs being cylindrical structural members and said buoyancy means each comprise a generally cylindrical buoyancy pod positioned at distal ends of each of said platform legs and having a diameter substantially greater than the diameter of said platform legs, said buoyancy pods each coaxially surround a distal end of a respective one of said platform legs, and

an uppermost portion of each of said buoyancy means being spaced from a lowermost portion of said platform deck, said uppermost portion operably extends substantially beneath the surface of the body of water when the



semi-submersible marine platform is on station and in a working posture such that said buoyancy means is substantially beneath horizontal wave energy of the body of water in a working mode of the semi-submersible marine platform·

frame members st ally interconnecting said plurality of platform legs and buoyancy means; and

stabilizer legs symmetrically disposed about said platform for stabilizing said semi-submersible marine platform, each of said stabilizer legs extending in a substantially vertical posture outside of the vertically extended periphery of said deck, said stabilizer legs each having a first portion extending within the body of water and a second portion extending above the surface of the body of water for providing a stabilizing cut water plane area for the platform outside the vertically extended periphery of the deck, said first portions being pivotally connected to generally horizontal extensions of said frame means such that said stabilizer legs may operably pivot in response to environmental forces, said stabilizer legs contributing no more than fifteen percent of the total buoyancy of the platform wherein platform buoyancy is provided substantially within the periphery of said deck by said buoyancy means positioned beneath said deck substantially independent of said buoyant stabilizer legs.

4,556,009

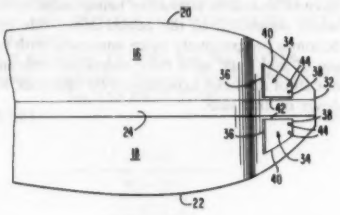
BOAT WITH STABILIZING FLAPS

Alex R. Kaye, 5 Patricia Pl., Menlo Park, Calif. 94025

Continuation of Ser. No. 462,811, Feb. 1, 1983, abandoned. This application Dec. 3, 1984, Ser. No. 677,331

Int. Cl.⁴ B63B *7/00*

U.S. Cl. 114—354 **7 Claims**



1. A boat comprising: a collapsible hull having a bow and a stern and having a pair of hingedly interconnected bottom panels extending between the bow and stern, there being a pair of side panels hingedly connected to respective bottom panels and extending longitudinally thereof, said hull being movable from a collapsed condition in which the panels are in substantial face-to-face relationship to an expanded condition in which adjacent panels extend outwardly from each other; a pair of first flaps secured to the outer surfaces of respective bottom panels on opposite sides of the hinge line between the bottom panels for causing the stern to ride relatively high in the water as the boat is driven in a forward direction whereby the boat remains substantially level with respect to the water surface during such forward movement, each of said first flaps being movable from a retracted position extending along the adjacent surface of a respective bottom panel to an operative position extending transversely of the respective bottom panel, each flap being in the retracted position when the hull is in said collapsed condition; and a second flap for each first flap, respectively, each second flap being coupled to the outer surface of a respective bottom panel and movable into an operative location in which the second flap engages the respective first flap and releasably holds it in its operative position, each second flap being movable into a retracted location in which the second flap extends along the adjacent surface of the respective bottom panel substantially contiguous with the respective first flap, whereby the hull and the first and second flaps form a compact unit when the hull is collapsed.

4,556,010

METHOD OF CONTROLLING NOXIOUS INSECTS

Bert Persson, and Hakan Svensson, both of Älggatan 47D, S-216 15 Malmö, Sweden

PCT No. PCT/SE82/00078, § 371 Date Sep. 30, 1982, § 102(e) Date Sep. 30, 1982, PCT Pub. No. WO82/03155, PCT Pub. Date Sep. 30, 1982

PCT Filed Mar. 19, 1982, Ser. No. 438,873

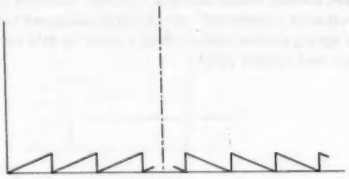
Claims priority, application Sweden, Mar. 20, 1981, 8101771

Int. Cl.⁴ G08B *1/00*

U.S. Cl. 116—22 R **6 Claims**

1. A method of controlling noxious insects by repressing the insect's oviposition and mating comprising providing illumination of variable intensity onto the infested area, gradually varying the intensity between a first value and a second value,

one of said values being higher than the other one, and abruptly changing the intensity from said second value to said



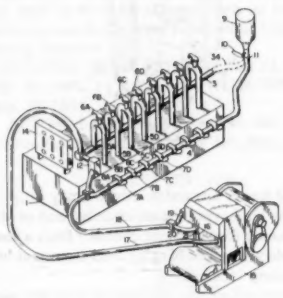
first value and periodically repeating the cycle as with a linear electronic saw tooth sweep circuit generator.

4,556,011

MULTICOLOR TINTER TANK SYSTEM

Henry Tarr, Slaterville Springs, N.Y., assignor to Auto-Tint, Inc., Ithaca, N.Y.

Filed Dec. 14, 1982, Ser. No. 449,592
Int. Cl.[4] B05C *11/10*
U.S. Cl. 118—46 **18 Claims**



1. A tank system for multicolor dispensing of tinting fluids to printing equipment or the like, requiring a continuous flow of fluids, comprising:

a. a plurality of tank means for containing fluids, at least one per color to be dispensed, each having inlet ports for entry of fluids into the tank located above the level of the fluid in the tank, and outlet ports for exit of fluid from the tank means;

b. inlet manifold means for conveying fluid to the tank means, for location above the fluid level in the tank means, comprising:

1. a level conduit having top, bottom, and side walls, a plurality of outlet ports in the side walls, a plurality of input port means for admitting fluid into the level conduit;

2. a plurality of valve means, at least one per tank, each having an input and an output, the input sealably connected to an outlet port of the conduit, and the output of at least one valve means per tank connected to an inlet port of one of the tank means and each having open and closed positions for controlling fluid flow from the outlet ports;

3. each of the outlet ports and valves being level with the conduit, such that fluid cannot pool in the ports, valves or conduit;

c. output manifold means for conveying fluid from the tank means, located above the tank means, comprising:

1. a sloping conduit having a top, a bottom, and side walls, upper and lower ends, a plurality of inlet ports in the top and a plurality of output ports;

2. Drain valve means for draining the output manifold, having open and closed positions, an input sealably connected to the lower end of the conduit and an output connected to an input port in the conduit of the inlet manifold means;

3. A plurality of inlet valve means, at least one for each tank means, located at the inlet ports of the conduit, each having an input and an output, the output sealably connected to an inlet port of the conduit;

4. a plurality of input tube means each having two ends, an output end connected to the input of the inlet valve means, and an input end for location below the fluid level in the tank means;

d. a plurality of pump means connected to the output manifold means for causing fluid to flow into the output manifold means from the tank means via the tube means;

e. output means for supplying fluid to the printing equipment having an input connected through a valve to an output port of the output manifold means, and an output adapted to supply fluid to the printing equipment;

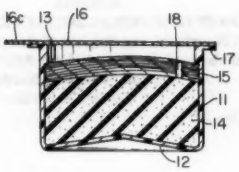
f. input means for accepting excess fluid from the printing equipment having an output connected to an input port means of the inlet manifold and an input adapted to receive fluid from the printing equipment.

4,556,012

DISPOSABLE INK CARTRIDGE

Frederick Scrudato, Florham Park, N.J., assignor to Finast Marking Supplies Inc., Livingston, N.J.

Filed Jun. 4, 1984, Ser. No. 617,127
Int. Cl.[4] B05C *1/00*
U.S. Cl. 118—268 **11 Claims**



1. An ink cartridge for a code dating maching having a reciprocating printing head which contacts said cartridge comprising:

(a) a hollow container having a top opening and an upwardly extending bottom;

(b) an ink absorbing pad located in said container;

(c) an ink distributing pad located in said container above said ink absorbing pad having a vacant hole extending therethrough terminating at the bottom of said ink distributing pad and being located a distance from the edge of said ink distributing pad short of the area of contact with said printing head; and

(d) means located over said opening for sealing said container.

4,556,013

SCREENED DONOR FOR TOUCHDOWN DEVELOPMENT

Robert W. Gundlach, Victor; William M. Schwarz, Jr., Webster, and Kenneth W. Gunther, Rochester, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

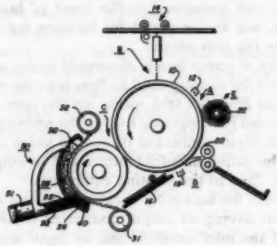
Filed Nov. 7, 1983, Ser. No. 549,096
Int. Cl.[4] G03G *15/08*
U.S. Cl. 118—624 **10 Claims**

1. An electrostatic development apparatus for developing

latent electrostatic images on an electrostatic latent image surface adapted to move in a predetermined direction comprising:

a donor member closely spaced from said electrostatic latent image surface and adapted to apply toner to said latent electrostatic images on said electrostatic latent image surface;

housing means adapted to be filled with toner and positioned adjacent said donor member for loading toner onto said donor member for electrostatic transfer to said electrostatic latent image surface; and



a webbed screen located in said housing means and adapted to contact said donor member so that the toner loaded from said housing means onto said donor member passes through said webbed screen means in order to make rubbing contact with and form a dense and uniform layer of toner onto the surface of said donor member, said webbed screen serving to friction charge the toner and smooth the layer of toner on said donor member in order to prevent streaking on said photosensitive surface.

4,556,014

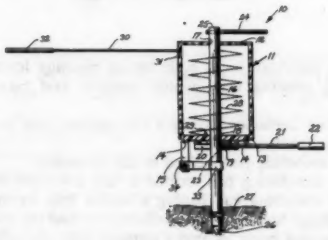
TRESPASS DISCOURAGING DEVICE FOR PETS

Howard W. Huntsman, and Stephen H. Huntsman, both of 94 E. 400 South, both of St. George, Utah 84770

Filed Aug. 20, 1984, Ser. No. 642,568

Int. Cl.⁴ A01K *15/02*

U.S. Cl. 119—29 **1 Claim**



1. A trespass discouraging device for pets, comprising, in combination, a hollow cylindrical housing having a cylindrical side wall and opposite circular end walls, an opening through a center of each said end wall, a vertical post supported at its lower end by insertion in the ground, an upper end of said post being received through said openings for freely rotating said housing around said post, a tension coil spring around said post and within said housing, one end of said spring being affixed to said housing and an opposite end thereof being affixed to said post, a plurality of ratchet teeth on an underside of said housing being along a circular row concentrically around said post, a single upwardly oriented ratchet pawl engaging said ratchet teeth being affixed to said post, a rod for whipping an animal being secured to said housing and extending radially outwardly therefrom, a disc member mounted to the bottom end wall of said housing, said disc member having a plurality of grooves formed therein, and a bait stick mounted to said post, said bait stick being capable of engaging any one of the grooves formed within said disc member, whereby removal of said bait stick permits said cylindrical housing and rod to rotate under spring tension and produce a noise by said ratchet teeth striking said ratchet pawl.

4,556,015

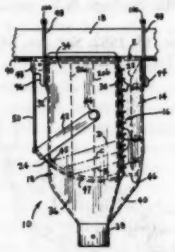
FEED PROPORTIONER

Denis L. Osborn, Canton, Ga., assignor to U.S. Industries, Inc., Stamford, Conn.

Filed Mar. 12, 1984, Ser. No. 588,222

Int. Cl.⁴ A01K *5/00*

U.S. Cl. 119—56 R **25 Claims**



1. An animal feeder apparatus, comprising:

a feed holding bin having a main chamber and an inlet means for introducing feed into said chamber from a feed supply;

means for selectively discharging feed from said bin into an animal feeding location;

means for controlling the amount of feed introduced into said chamber, said controlling means including a plurality of vertically arrayed gate means located between said inlet means and said main chamber for selectively permitting or preventing the passage of feed therebetween, whereby when selected ones of each of said vertically arrayed gate means are opened, the passage of feed therethrough is permitted to fill said chamber to a predetermined level depending upon which of said gate means is open.

4,556,016

LIFTING DEVICES

Thomas B. Snell, Hillview, Penn La., Hardington Mandeville, Somerset, and Peter S. Kerton, Higher Farm, Chilton Cantelo, Yeovil, Somerset, both of England

PCT No. PCT/GB82/00274, § 371 Date May 19, 1983, § 102(e) Date May 19, 1983, PCT Pub. No. WO83/00982, PCT Pub. Date Mar. 31, 1983

PCT Filed Sep. 20, 1982, Ser. No. 503,198

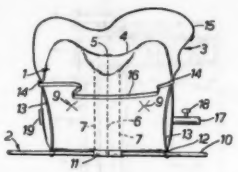
Claims priority, application United Kingdom, Sep. 19, 1981, 8128368; Oct. 14, 1981, 8130986; Nov. 30, 1981, 8136023; Mar. 3, 1982, 8206140; Apr. 29, 1982, 8212416

Int. Cl.⁴ A61D *3/00*

U.S. Cl. 119—102 **27 Claims**

1. A lifting device for animals comprising an inflatable bag which, when inflated without a superimposed load, has a depression in its upper face for locating an animal straddling the

bag stabilising means including a base, and slide means carried by lower peripheral portions of the bag which slidably anchor



the bag to the base, said base having a lateral span substantially greater than the inflated bag.

4,556,017

FLUIDIZED BED COMBUSTION APPARATUS

Alan T. Couch, Carshalton; Terence D. Cruickshank, Bromley, both of England; William L. E. Davey, Modderfontein, South Africa; Anthony R. Marshall, Horsham, England; Christopher B. Tydd, and David R. Wakeford, both of East Grinstead, England, assignors to Fluidised Combustion Contractors Limited, Sussex, England

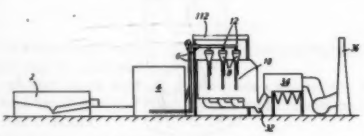
PCT No. PCT/GB84/00190, § 371 Date Jan. 31, 1985, § 102(e) Date Jan. 31, 1985, PCT Pub. No. WO84/04954, PCT Pub. Date Dec. 20, 1984

PCT Filed Jun. 1, 1984, Ser. No. 697,125

Claims priority, application United Kingdom, Jun. 3, 1983, 8315215

Int. Cl.[4] F22B *1/02*

U.S. Cl. 122—4 D **10 Claims**



1. A fluidised bed combustion apparatus arranged to be fired by flyash including a furnace chamber (14) having tubulous walls (18, 20, 22), floor (54) and roof (44, 48) connected to extend between distributor means (40) subjacent the base of the furnace chamber and collector means (60) adjacent the roof of the furnace chamber, a lateral gas pass (26) extending from an upper region of the furnace chamber containing a vapour generating tube bank (64) extending between a lower, liquid, drum (62) and an upper, vapour and liquid, drum (50) connected to the collectors, a down pass (30) extending from the lateral gas pass containing an economiser tube tank (16) and an airheater (68) and having at the base thereof a grits hopper (32), the downpass discharging through a bag filter means (34) to a flue (36), characterised in that means for firing the flyash include chutes (80) discharging through ports in the furnace chamber walls (18) closely superjacent the floor (54) and inclined chutes (82) extending through the furnace chamber walls (18) at an intermediate level to discharge closely superjacent the floor (54) at locations spaced from the walls, the inclined chutes being surrounded by tube lengths (88) extending from the floor (54) connected into respective tubulous walls (18), and a windbox (102) subjacent the floor discharging fluidising air from the airheater (68) through nozzles (108) extending through the floor to form a fluidised bed of the flyash.

4,556,018

STEAM BOILER

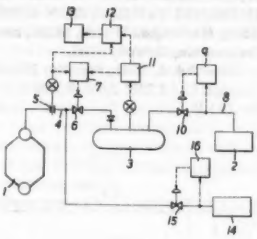
Akihiko Agata, Isahaya, Japan, assignor to Shin-Ei Kabushiki Kaisha, Isahaya, Japan

Filed Nov. 28, 1984, Ser. No. 675,860

Claims priority, application Japan, Nov. 28, 1983, 58-183438[U]

Int. Cl.[4] F22B *37/22*

U.S. Cl. 122—35 **4 Claims**



1. A steam boiler having a steam accumulator connected between said boiler and a user, a flow meter provided on the inlet side of said steam accumulator, and a pressure detector provided on said steam accumulator for detecting the internal pressure thereof, characterized in that said steam boiler comprises:

a steam load detector adapted to calculate the steam load on the outlet side of said steam accumulator on the basis of a signal of steam flow rate from said flow meter and a signal of pressure variation from said pressure detector.

4,556,019

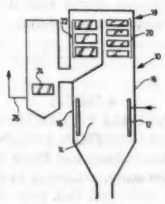
CONVECTION SECTION ASH MONITORING

John R. Wynnyckyj, Kitchener; Edward Rhodes, Waterloo, and Robert Marr, Kitchener, all of Canada, assignors to University of Waterloo, Waterloo, Canada

Filed Feb. 24, 1984, Ser. No. 583,573

Int. Cl.[4] F22B *37/18*

U.S. Cl. 122—379 **18 Claims**



1. A method of controlling the build up of ash on the heat exchange surfaces of a convection section of a steam generator wherein a flowing hot gas stream contacts the heat exchange surfaces to heat steam flowing within the surfaces and said heat exchange surfaces in said convection section comprises a series of banks of heat exchange tubes, which comprises:

directly measuring the temperature of the gas stream at two locations in the flowing gas stream spaced-apart in the direction of flow using radiation pyrometers positioned one on each longitudinal side of each tube bank as determined by the direction of flow to determine the temperature difference between each side of each bank as a measure of the build-up of ash on each of said tube banks, calculating the difference in temperature between said

two locations as a measure of the build-up of ash on each said tube band, and

activating selective cleaning of said tube banks in response to a predetermined level of build-up of ash thereon.

4,556,020

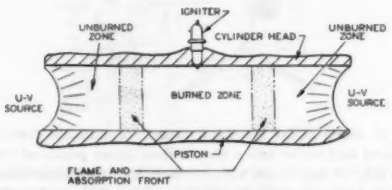
METHOD AND MEANS FOR STIMULATING COMBUSTION ESPECIALLY OF LEAN MIXTURES IN INTERNAL COMBUSTION ENGINES

Robert Hickling, Huntington Woods, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jul. 6, 1981, Ser. No. 280,897

Int. Cl.[4] F23H *5/26*; F23N *5/20*

U.S. Cl. 123—143 B **3 Claims**



1. A method for combustion of air-fuel mixtures, said method comprising the steps of:

providing and compressing a combustible air-fuel mixture in a closed combustion chamber;

igniting the air-fuel mixture at an ignition point to establish a flame front of burning mixture, said flame front dividing the combustion chamber into a burned zone containing relatively high temperature combustion products and an unburned zone containing an unburned charge of significantly lower temperature; and

stimulating combustion in the flame front by directing thereon from the unburned zone ultraviolet radiation primarily consisting of wavelengths exceeding 190 nm which largely pass through the cooler charge in the unburned zone and are absorbed by higher temperature oxygen molecules in the flame front to disassociate the molecules to oxygen atoms that directly stimulate the combustion process as it proceeds.

4,556,021

DEVICE FOR MANUALLY STARTING AN INTERNAL COMBUSTION ENGINE

Max Anetzberger, Hauzenberg, and Erich Eder, Vornbach, both of Fed. Rep. of Germany, assignors to Motorenfabrik Hatz GmbH & Co. KG, Ruhstorf, Fed. Rep. of Germany

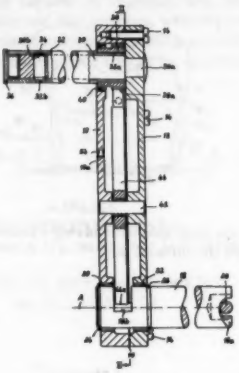
Filed Mar. 15, 1984, Ser. No. 590,019

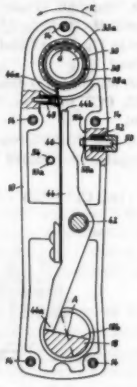
Claims priority, application Fed. Rep. of Germany, Apr. 16, 1983, 3313891

Int. Cl.[4] F02N *1/02*

U.S. Cl. 123—185 S **18 Claims**

1. A device which is separate from and can be temporarily coupled to an internal combustion engine for manually starting the engine, said device comprising a closed casing, a shaft rotatably supported on said casing and having means for releasably coupling said shaft to a movable component of the engine, a hand crank supported on said casing, and safety coupling means for operatively coupling said shaft and said crank in a manner so that, in the event a kickback is imparted to said shaft by the engine during starting and in the event an operator releases said hand crank during starting, the coupling between said hand crank and said shaft is interrupted, wherein said safety coupling means is substantially disposed in said closed casing and wherein said closed casing is filled with a





frostproofing lubricant and includes sealing means for preventing said frostproofing lubricant from escaping.

4,556,022

EXHAUST VALVE FOR DIESEL ENGINE AND PRODUCTION THEREOF

Takemi Yamada, Tokyo; Tamotaro Satoh, Yokohama; Masaaki Mizushina, Fujisawa; Koji Toyota, and Hiromi Okamoto, both of Yokohama, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 315,666, Oct. 28, 1981, Pat. No. 4,530,322. This application Feb. 25, 1985, Ser. No. 705,324

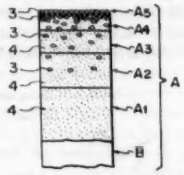
Claims priority, application Japan, Oct. 31, 1980, 55-152264; Sep. 24, 1981, 56-149620

Int. Cl.[4] F01L *3/04*

U.S. Cl. 123—188 AA **19 Claims**

1. An exhaust valve for a Diesel engine, wherein a seat face thereof is formed with coated layer comprising ceramic and

metal, the coated layer increasing in density of ceramic toward an upper surface thereof, wherein the coated layer comprises a



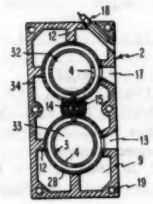
plurality of layers which each vary in ceramic density, and wherein the coated layer comprises a double structure.

4,556,023

ROTARY VALVES AND GEAR TIMING

Joseph Giocastro, 6428 Metropolitan Ave., Middle Village; Salvatore Giocastro, 5311 73th St., Maspeth, and James Giocastro, 6428 Metropolitan Ave., Middle Village, all of N.Y. 11379

Filed Aug. 2, 1983, Ser. No. 519,105
Int. Cl.[4] F01L *7/00*
U.S. Cl. 123—190 A **4 Claims**



1. A rotary valve system for an internal combustion engine, comprising, in combination,

a cylinder block forming at least one cylinder for a piston, said block forming paired intake and exhaust openings to said cylinder,

a crankshaft connected to said piston,

a cylinder head member positioned over said cylinder block,

a source of fuel mixture,

a first cylinder sleeve positioned within and connected to said head member forming intake port means for passing said fuel mixture to said intake opening of said cylinder.

a second cylindrical sleeve positioned in and connected to said head member parallel with said first sleeve forming exhaust port means for passing burned gases from said exhaust opening of said cylinder to the atmosphere,

first shaft means rotatably positioned in said first sleeve, said first shaft means forming intake passage means capable of being aligned with said intake opening to said cylinder and said intake port means of said first sleeve wherein said fuel mixture is passed through said intake port means, said intake passage means, and said intake opening to said cylinder.

second shaft means rotatably positioned in said second sleeve, said second shaft forming exhaust passage means capable of being aligned with said exhaust opening to said cylinder and said exhaust port means of said second sleeve wherein exhaust gases are passed from said cylinder through said exhaust opening, said exhaust passage means, and said exhaust port means to the atmosphere,

drive means connected to said crankshaft and to said first and second shaft means for transferring rotational movement of said crankshaft to said first and second shaft means,

timing means associated with said drive means for timing the alignment of said inlet and exhaust passage means of said first and second shaft means with said intake and exhaust openings of said cylinder block and with said intake and exhaust port means of said first and second sleeves,

said first and second shaft means being first and second shafts respectively forming intake and exhaust hollows respectively extending along the lengths of said first and second shafts, said intake passage means including said intake hollow and an intake passage formed by said first shaft, said intake hollow having an end portion opening to said source of fuel mixture and said intake passage being capable of being aligned with said intake port means of said first sleeve and said intake opening to said cylinder,

a lubricant-fed felt member positioned between said first and second cylindrical sleeves and touching and lubricating each first and second shaft means,

said cylinder head members having outer walls, and ribs extending between said outer walls of said cylinder head member and said first and second sleeves; said ribs forming cutout portions, and

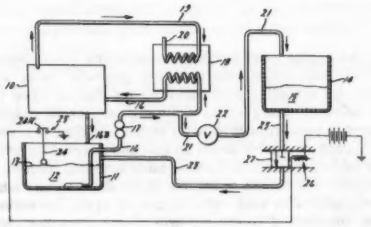
a cooling fluid passing through said cutout portions between said ribs.

4,556,024

ENGINE LUBRICATION SYSTEM

Edward T. King, Dearborn, and Granger K. Chui, Dearborn Heights, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Jan. 7, 1985, Ser. No. 689,365
Int. Cl.[4] F01M *1/00*
U.S. Cl. 123—196 AB **16 Claims**



1. An engine lubrication means for recirculating lubricant to an internal combustion engine adapted to be cooled by a cooling fluid, providing both enhanced lubricant capacity and accelerated lubricant heating upon engine startup, said means comprising:

(A) a primary lubricant circuit comprising a primary lubricant reservoir adapted to receive lubricant drainage from said engine and a primary conduit adapted to communicate lubricant from said primary lubricant reservoir to said engine;

(B) means for pumping lubricant through said primary conduit from said primary lubricant reservoir to said engine;

(C) means for sensing the lubricant level within said primary lubricant reservoir;

(D) means for heating said lubricant with heat produced by said engine, comprising a heat exchanger in line with said primary conduit between said primary lubricant reservoir and said engine, said heat exchanger being adapted to receive a flow of heated fluid from said engine;

(E) an auxiliary lubricant reservoir;

(F) means for communicating lubricant from said auxiliary lubricant reservoir to said primary lubricant reservoir when the lubricant level within said primary lubricant reservoir is below a preselected level, said communicating means being adapted to be actuated by said means for sensing the lubricant level within said primary lubricant

reservoir when the lubricant level with said primary lubricant reservoir is below a preselected level; and

(G) means for selectively diverting lubricant from said primary circuit to said auxiliary reservoir, said diverting means being adapted to divert lubricant to said auxiliary reservoir when the temperature of lubricant within said primary circuit exceeds a preselected level.

4,556,025

ENGINE VALVE MECHANISM HAVING VALVE DISABLING DEVICE

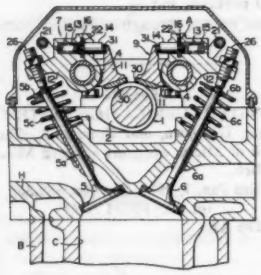
Yasuyaki Morita, Hiroshima, Japan, assignor to Mazda Motor Corporation, Hiroshima, Japan

Filed Nov. 16, 1984, Ser. No. 671,946

Claims priority, application Japan, Nov. 18, 1983, 58-218378; Nov. 26, 1983, 58-222600; Dec. 2, 1983, 58-229008

Int. Cl.[4] F02D *13/06*

U.S. Cl. 123—198 F **8 Claims**



1. An engine valve mechanism including valve means which is resiliently urged into a closed position, valve actuating means for actuating said valve means into an open position, said valve actuating means including cam means adapted to be rotated in synchronism with an engine rotation, first swingable arm means swingable about an axis and adapted to be engaged with said cam means to be swingably actuated thereby, second swingable arm means swingable about said axis and adapted to be engaged with said valve means to open the valve means when the second swingable arm means is swung about said axis, plunger means provided on one of said first and second swingable arm means and axially slidably movable on said one arm means, resilient means for urging said plunger means axially to have one end of said plunger means engage with the other swingable arm means, mechanical constraining means movable between a constraining position wherein it constrains the plunger means at a projected position against axial movement so that a swingable movement of the first swingable arm means is transmitted through the plunger means to the second swingable arm means to have the valve means actuated by the cam means and a retracted position wherein the plunger means is made free to move axially against the resilient means so that the second swingable arm means is maintained stationary even when the first swingable arm means is actuated by the cam means to hold the valve means in the closed position.

4,556,026

MULTIPLE-DISPLACEMENT ENGINE

Shunji Masuda; Hisashi Nakaya, and Katumi Okazaki, all of Hiroshima, Japan, assignors to Mazda Motor Corporation, Japan

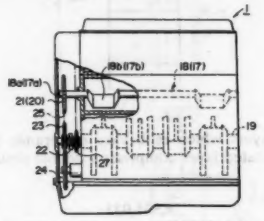
Continuation of Ser. No. 643,146, Aug. 22, 1984, abandoned. This application Mar. 18, 1985, Ser. No. 712,915

Claims priority, application Japan, Aug. 31, 1983, 58-159732

Int. Cl.[4] F02D *17/00*; F16F *15/26*

U.S. Cl. 123—198 F **3 Claims**

1. A multiple-displacement engine which can be operated either in a full-displacement state in which all the cylinders thereof are operative or a part-displacement state in which a part of the cylinders are inoperative, and comprises fuel supply interruption means for cutting fuel supply to a part of the cylinders, operating condition detecting means for detecting operating condition of the engine, and cylinder number control means which determines the number of cylinders to be supplied with fuel according to a signal from the operating condi-



tion detecting means and actuates the fuel supply interruption means, characterized by having balancer means for generating moment which attenuates torque fluctuation due to explosion in the operative cylinders in the part-displacement state of the engine, and balancer actuating means which receives a control signal from the cylinder number control means and actuates the balancer when the engine is operated in the part-displacement state.

4,556,027

EXHAUST BRAKING SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

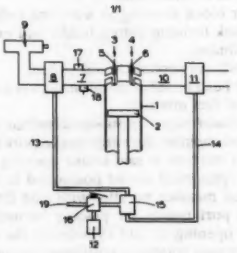
Victor A. Harris, London, England, assignor to Hersham Valves Ltd., Walton on Thames, England

Filed Oct. 26, 1984, Ser. No. 665,127

Claims priority, application United Kingdom, Oct. 28, 1983, 8328902

Int. Cl.[4] F02D *9/06*

U.S. Cl. 123—323 **12 Claims**



1. An exhaust braking system for an internal engine having an inlet valve and an exhaust valve, the system comprising an induction valve arranged to be connected in an induction passage to the inlet valve, an exhaust brake arranged to be connected in an exhaust system connected with an exhaust valve, actuator means connected in a fluid circuit with the induction valve and exhaust brake for operating the induction valve and exhaust brake to close the induction passage and exhaust system when the rotational speed of the engine is to be retarded, timing means connected with the induction valve and exhaust brake for ensuring the exhaust brake is closed no later than the closing of the induction valve, a non-return valve arranged to be connected in the induction passage between the induction valve and inlet valve for facilitating an increase in presssure within a piston cylinder of the engine to increase the engine retardation, and pressure sensitive means arranged to be

connected in the induction passage for controlling maximum pressure of the braking system.

11. A method of operating an exhaust brake system for an internal combustion engine having an inlet valve and exhaust valve, the method comprising actuating an induction valve arranged to be connected in an induction passage to the inlet valve, actuating an exhaust brake arranged to be connected in an exhaust system connected with the exhaust valve, operating actuating means connected in a fluid circuit with the induction valve and exhaust brake to initiate actuation of the induction valve and exhaust brake through the intermediary of timing means connected with the induction valve and exhaust brake for ensuring the exhaust brake is closed no later than the closing of the induction valve to close the induction passage and exhaust system when the rotational speed of the engine is to be retarded, introducing the air into the induction passage through a non-return valve connected in the passage between the induction valve and inlet valve to facilitate increase in pressure within the piston cylinder of the engine to increase engine retardation, and controlling the maximum pressure of the braking system by venting the system through pressure sensitive means arranged to be connected in the induction passage.

4,556,028

ARRANGEMENT FOR REGULATING THE IDLING SPEED OF AN INTERNAL COMBUSTION ENGINE

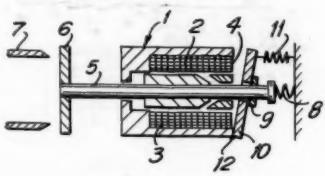
Stephan Wietschorke, Usingen, and Horst Schlick, Schwalbach, both of Fed. Rep. of Germany, assignors to VDO Adolf Schindling AG, Frankfurt am Main, Fed. Rep. of Germany

Filed Jan. 25, 1984, Ser. No. 573,720

Claims priority, application Fed. Rep. of Germany, Jan. 26, 1983, 3302435

Int. Cl.⁴ F02B *3/00*

U.S. Cl. 123—339 **5 Claims**



1. In a system for regulating the idling speed of an internal combustion engine by control of intake by means of an electromechanical control unit, the control unit having a valve element which is movable by a solenoid in opposition to the force of a return spring, the improvement comprising:

a valve element having a stem,

a solenoid disposed about said stem for displacing said valve element,

a stop firmly attached to said stem,

a ferromagnetic actuating element disposed about said stem between said solenoid and said stop,

a return spring contacting an end of said stem,

means comprising at least one auxiliary spring for moving said actuating element with respect to the valve element, as far as said stop, and wherein

said auxiliary spring is so sized with respect to said return spring that when the solenoid is without current, the valve element is held in a position of average air flow by the auxiliary spring and the return spring which act upon said valve element in opposite directions.

4,556,029

BACK-UP SYSTEM AND METHOD FOR ENGINE COOLANT TEMPERATURE SENSOR IN ELECTRONIC ENGINE CONTROL SYSTEM

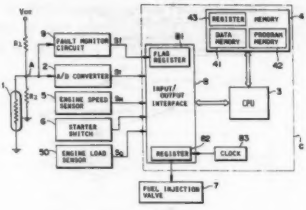
Hiroshi Yamaguchi; Kunifumi Sawamoto, both of Yokosuka; Hiroshi Sanbuichi; Tatsuo Morita, both of Yokohama, and Satoshi Takizawa, Yokosuka, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Mar. 28, 1983, Ser. No. 479,482

Claims priority, application Japan, Apr. 2, 1982, 57-53679

Int. Cl.⁴ F01P *11/16;* **F02D** *5/00*

U.S. Cl. 123—41.15 **28 Claims**



1. A back-up system for an engine coolant temperature sensor in an engine control system, comprising:

a fuel injection valve;

an engine coolant temperature sensor for detecting an engine coolant temperature and producing an engine coolant temperature signal indicative of the engine coolant temperature;

an engine speed sensor for detecting an engine revolution speed and producing an engine speed signal indicative of the engine speed;

monitoring means for detecting failure of the engine coolant temperature sensor to produce a fault signal;

a starter switch for producing a starter signal while it is turned ON for starting up the engine;

arithmetic means, responsive to turning ON of said starter switch, for producing a fuel injection pulse to be fed to said fuel injection valve having a pulsewidth gradually increased from a predetermined initial pulsewidth, for measuring a period of time in which said starter switch is maintained at ON position to assume the engine coolant temperature on the basis of the measured period of time, for determining a calorific value produced by the engine revolution on the basis of the engine speed signal to determine an increasing value of the engine coolant temperature after the engine starting up, said arithmetic means producing an assumed engine coolant temperature signal indicative of the assumed engine coolant temperature.

4,556,030

CONTROL ARRANGEMENT FOR INTERNAL COMBUSTION ENGINE

Shigeo Aono, Tokyo, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Jan. 25, 1984, Ser. No. 573,763

Claims priority, application Japan, Jan. 26, 1983, 58-9927; Jan. 26, 1983, 58-9928

Int. Cl.⁴ F02D *37/02*

U.S. Cl. 123—425 **6 Claims**

1. In an internal combustion engine having a piston operatively connected with a crankshaft and movably disposed in a cylinder to define a combustion chamber, a control system comprising:

a sensor for sensing the pressure prevailing in said combustion chamber;

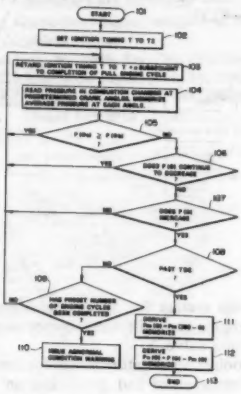
a circuit responsive to the output of said sensor, said circuit comprising:

means for arranging the ignition timing so that pressure due

to combustion does not occur during the compression stroke;

means for recording the change in pressure in the combustion chamber which occurs with movement of said piston during said compression stroke;

means for using the recorded data to derive the motoring pressure characteristics which occur during the expansion stroke and thus obtain the motoring pressure characteristics for said compression and expansion strokes irrespective of the presence of combustion pressure being produced during said expansion stroke;



means for computing at least one combustion process parameter using said motoring characteristics; and

means for comparing said at least one combustion process parameter with predetermined data for determining the difference therebetween; and

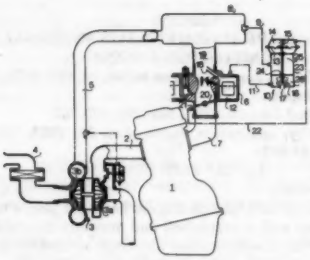
means responsive to said circuit for controlling an engine control parameter in a manner to eliminate said difference.

4,556,031

SYSTEM FOR CONTROLLING A CARBURETOR OF AN INTERNAL COMBUSTION ENGINE

Katsuhiko Sugiura, Tama, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 4, 1984, Ser. No. 567,982
Claims priority, application Japan, Jan. 7, 1983, 58-001518
Int. Cl.[4] F02M 5/08
U.S. Cl. 123—437 **5 Claims**



1. A system for controlling a carburetor of an engine provided with a supercharger having a compressor, comprising:

an intake pipe at an end thereof connected to said compressor;

a chamber communicated with the other end of said intake pipe;

said carburetor includes means comprising a float chamber for supplying fuel to said carburetor;

passage means comprising a first passage communicating with said first-mentioned chamber and a second passage communicating with said float chamber;

an intake passage for communicating said intake pipe with said carburetor via said first-mentioned chamber;

said carburetor includes a vent pipe communicating said float chamber with said intake passage;

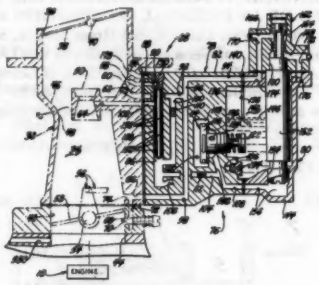
a changeover valve means responsive to said intake passage at a downstream side of said carburetor at heavy load conditions of the engine for communicating said first and second passages, and respectively at light load conditions of the engine for communicating said float chamber with atmosphere.

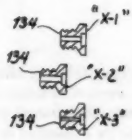
4,556,032

ADAPTER MEANS FOR CREATING AN OPEN LOOP MANUALLY ADJUSTABLE APPARATUS AND SYSTEM FOR SELECTIVELY CONTROLLING THE AIR-FUEL RATIO SUPPLIED TO A COMBUSTION ENGINE

Robert J. Miller, Warren, Mich., assignor to Colt Industries Operating Corp, New York, N.Y.

Filed Jan. 5, 1984, Ser. No. 568,393
Int. Cl.[4] F02M 7/12
U.S. Cl. 123—438 **20 Claims**





1. A kit assembly for converting an existing carburetor assembly for a vehicular combustion engine to an improved carburetor assembly having an open loop manually adjustable system for selectively controlling the air-fuel ratio supplied to said vehicular combustion engine; wherein said vehicle has ground-engaging drive wheel means, power transmission means for conveying power from the engine to said wheel means, and a source of fuel; wherein said engine is provided with induction passage means of which said first-mentioned carburetor assembly comprises a portion for supplying motive fluid to said engine; wherein said first-mentioned carburetor assembly comprises body means and separable first fuel reservoir means, and wherein said carburetor body means comprises first fuel passage means therein for conveying fuel from said first fuel reservoir means to induction passage means; said

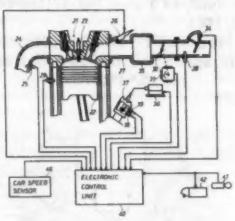
kit assembly comprising second fuel reservoir means, said second fuel reservoir means comprising housing means carrying second fuel flow passage means for flowing fuel from said second fuel reservoir means to said first fuel passage means when said first fuel reservoir means is disassembled from said carburetor body means and replaced by said second fuel reservoir means, said first fuel flow passage means and said second fuel flow passage means when operatively connected to each other serving to define carburetor fuel conduit means, a plurality of fuel flow restriction members being calibrated differently from each other so that the rate of fuel flow through one of said restriction members is different from the rate of fuel flow through an other of said restriction members for the same pressure head, wherein a selected one of said plurality of fuel flow restriction members is employed for placing in series flow relationship with said carburetor fuel conduit means, cyclically openable and closeable valving means operatively carried by said second fuel reservoir means, said valving means being in said carburetor fuel conduit means and effective to controllably alter the rate of metered fuel flow through said carburetor fuel conduit means, and manually controlled adjustment means operatively connected to said valving means, said manually controlled adjustment means being effective to selectively control the relative percentage of time that said valving means is opened and the relative percentage of time that said valving means is closed in order to thereby selectively alter the rate of metered fuel flow through said carburetor fuel conduit means and to said engine.

4,556,033

AIR/FUEL RATIO FEEDBACK CONTROL FOR AN INTERNAL COMBUSTION ENGINE

Toshimitsu Ito, and Nobuyuki Kobayashi, both of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyoto, Japan

Filed Feb. 24, 1984, Ser. No. 583,267
Claims priority, application Japan, Mar. 14, 1983, 58-42843
Int. Cl.⁴ F02D *35/00*; F02M *51/00*; F02B *3/04*
U.S. Cl. 123—440 **6 Claims**



1. A method of performing air fuel ratio feedback control for an internal combustion engine comprising the steps of:

(a) measuring the output value of an oxygen sensor, said output value representing oxygen concentration in exhaust gas of said engine;

(b) comparing said output value with a standard value, both with said standard value as added by a positive reference value and with said standard value as added by a negative reference value;

(c) determining, based on said comparing step, that the air/fuel ratio is rich when said output value is greater than said standard value and is lean when said output value is less than said standard value;

(d) updating, based on said comparing step, said standard value to be equal to said output value subtracted by said positive reference value only when said output value is greater than said standard value added by said positive reference value and to be equal to said output value subtracted by said negative reference value only when said output value is less than said standard value added by said negative reference value;

(e) comparing said standard value with a predetermined value;

(f) correcting, based on the first and second comparing steps, said standard value toward said predetermined value when said standard value is greater than said output value and is greater than said predetermined value, and when said standard value is less than said output value and is less than said predetermined value; and

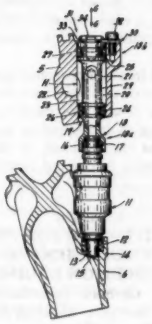
(g) controlling, based on said first comparing step, said engine air/fuel ratio toward optimum air/fuel ratio by decreasing an amount of fuel injection when the air/fuel ratio is determined to be rich, and by increasing the amount of fuel injection when the air/fuel ratio is determined to be lean.

4,556,034

FUEL SUPPLY DEVICE FOR INTERNAL COMBUSTION ENGINES

Bruno Anklam, Korntal; Reinhard Köenneker, Moensheim, and Hans Mezger, Freiberg, all of Fed. Rep. of Germany, assignors to Harley-Davidson Motor Co., Inc., Milwaukee, Wis.

Filed Jun. 19, 1984, Ser. No. 622,069
Claims priority, application Fed. Rep. of Germany, Jun. 25, 1983, 3323010
Int. Cl.⁴ F02M *55/02*
U.S. Cl. 123—470 **20 Claims**

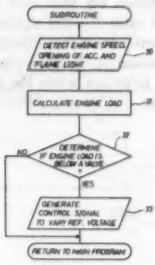


1. A fuel supply device for an internal combustion engine, said device including a housing having a bore, fuel supply means and at least one fuel injection valve having opposite end portions which are constructed and arranged to be supported, said injection valve having an injection opening and first holding means engaging the end portion of the valve having the injection opening and a second holding means including a connector engaging the end of the valve remote from the injection opening, the improvement wherein the second holding means has a piston like head portion disposed in said bore, said bore being connected to said fuel supply means, said head portion having a recessed region defining a fuel supply area and spaced apart sealing means disposed on the opposite sides of said fuel supply area and cooperating with the bore to define the margins of the fuel supply area, and a first passage in said second holding means between said fuel supply region and the connector.

4,556,035
METHOD AND APPARATUS FOR DETECTING THE IGNITION TIME POINT OF AN ENGINE

Keiji Aoki, and Shinji Ikeda, both of Susono, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed May 11, 1984, Ser. No. 609,185
Claims priority, application Japan, May 18, 1983, 58-87259; May 23, 1983, 58-90180
Int. Cl.⁴ F02P *5/04*; F02D *1/06*
U.S. Cl. 123—488 **13 Claims**



2. A system of detecting an ignition timing of an internal combustion engine comprising:

(a) means for detecting burning flame light in a combustion chamber of an engine;

(b) means for converting said burning flame light to an electric signal;

(c) means connected to said light detecting means for transmitting said burning flame light to said converting means;

(d) first signal generating means for generating a signal representative of current engine load;

(e) means for comparing said electric signal with a reference signal representing a pre-set voltage level and for producing an output signal representative of said comparison;

(f) means for determining ignition timing based on a said output signal; and

(g) means connected to said first signal generating means for changing the value of said reference signal in such a manner that said value of said reference signal in such a manner that said value is increased in accordance with an increase in current engine load, or decreased in accordance with a decrease in current engine load.

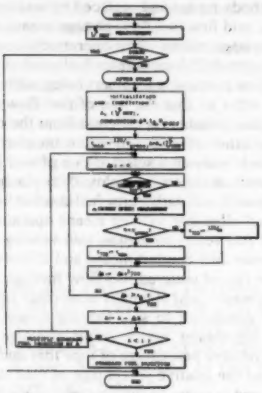
4,556,036
METHOD OF AND DEVICE FOR CONTROLLING AFTER-START ENRICHMENT OF INTERNAL COMBUSTION ENGINE

Erwin Gloss, Korntal; Gerhard Lotterbach, Markgröningen; Egbert Perenthaler, Stuttgart; Manfred Schenk, Schorndorf; Jan F. Van Woudenberg, Markgröningen, and Udo Zucker, Bönnigheim, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jul. 2, 1984, Ser. No. 626,622
Claims priority, application Fed. Rep. of Germany, Jul. 23, 1983, 3326575
Int. Cl.⁴ F02D *5/02*
U.S. Cl. 123—491 **5 Claims**

1. A method of controlling after-start fuel enrichment of an internal combustion engine supplied with fuel-air mixture from an injection system including injection valves and an injection control circuit for delivering control pulses whose duration during the after-starting enrichment phase is increased to a value corresponding to the product of the duration of the injection pulses during the normal operational phase of the engine and an enrichment factor, the method comprising steps of setting the enrichment factor at the beginning of the after-starting fuel enrichment phase to an initial value $A_o > 1$ depending on momentary temperature of the engine;

continuously reducing during the enrichment phase the enrichment factor at a constant rate toward a value $A = 1$ while keeping a constant time derivative of the enrichment factor for all rotary speeds below a predetermined rotary speed limit; and when said speed limit is exceeded,

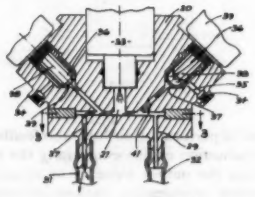


continuously reducing the enrichment factor at a rate which increases proportionally with the increase of rotary speed.

4,556,037
APPARATUS FOR THE UNIFORM DISTRIBUTION OF FUEL TO A MULTI CYLINDER SPARK IGNITION ENGINE

James R. Wisdom, Manchester, England, assignor to Shirley A. Wisdom, New South Wales, Australia

PCT No. PCT/AU84/00086, § 371 Date Jan. 18, 1985, § 102(e) Date Jan. 18, 1985, PCT Pub. No. WO84/04568, PCT Pub. Date Nov. 22, 1984
PCT Filed May 17, 1984, Ser. No. 694,385
Claims priority, application Australia, May 18, 1983, PF9422
Int. Cl.⁴ F02B *3/00*
U.S. Cl. 123—531 **5 Claims**



1. The present invention consists in apparatus for the uniform distribution of fuel to a multi-cylinder spark ignition engine comprising a fuel metering device arranged to deliver discrete metered quantities of fuel in accordance with the requirements of the cylinders of the engine, means defining a catchment chamber arranged to receive each such quantity, a plurality of passages extending from said chamber, one for each cylinder of the engine, each said passage being connected through a conduit to the induction passage of one cylinder, means for admitting gas under pressure to said passages to expel each quantity of fuel from the chamber and means for directing the flow of gas from said chamber along each of said passages in turn whereby a metered quantity of fuel is delivered to each cylinder in turn.

4,556,038

SUPERCHARGED INTERNAL COMBUSTION ENGINE HAVING CONTROL MEANS RESPONSIVE TO ENGINE SPEED AND ACCELERATOR PEDAL VELOCITY

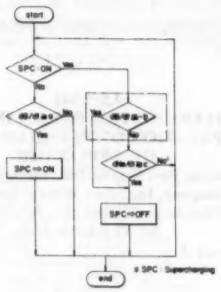
Toshiaki Okamoto, Okazaki; Tomio Oguma, Anjo, and Matasaburo Kaga, Nishio, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Dec. 22, 1983, Ser. No. 564,161

Claims priority, application Japan, Mar. 4, 1983, 58-34647; Mar. 4, 1983, 58-34648

Int. Cl.[4] F02D *23/00*

U.S. Cl. 123—564 8 Claims



1. Apparatus for controlling a supercharger on an engine whose speed is regulated by an operator-actuated accelerator, comprising:

means for detecting the rate of change of the position of the accelerator;

means for comparing the detected rate of change of accelerator position with first and second reference values and providing a signal related to whether the detected rate of change is less than each of said reference values;

means responsive to the signal from said comparing means for generating a supercharging signal when the detected rate of change of position of the accelerator in one direction of movement is greater than said first reference value and for generating a termination signal when the detected rate of of change of position of the accelerator in the opposite direction of movement is greater than said second reference value; and

means responsive to the signals from said signal generating means for controlling the supercharger to selectively supply compressed air to the engine.

4,556,039

METHOD AND APPARATUS FOR ADAPTING AND CONTROLLING THE EXHAUST GAS CIRCULATION RATE

Helmut Kniss, Waiblingen, and Johannes Locher, Stuttgart, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Aug. 12, 1983, Ser. No. 522,763

Claims priority, application Fed. Rep. of Germany, Oct. 23, 1982, 3239287

Int. Cl.[4] F02D *21/08*

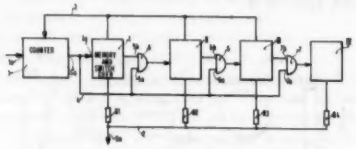
U.S. Cl. 123—569 11 Claims

1. A method for controlling an exhaust gas recirculation rate in internal combustion engines, in particular Diesel engines, and in particular for compensating for operating conditions which affect proportions of a fuel-air mixture supplied at a given time and wherein said operating conditions are subjected to a process of alteration which fades with time, comprising the steps of,

ascertaining a duration of operation up to a time when said altering process of said operating condition begins,

generating triggering control pulses in response to said ascertaining step,

adjusting said exhaust gas recirculation rate at fixed predetermined time intervals after the start-up of the engine in accordance with said ascertaining step, and



simultaneously storing permanently an attained position value of an adjustment of said exhaust gas recirculation rate.

4,556,040

DISTRIBUTORLESS IGNITION SYSTEM FOR MULTI-CYLINDER INTERNAL COMBUSTION ENGINE WITH MISFIRE SUPPRESSION

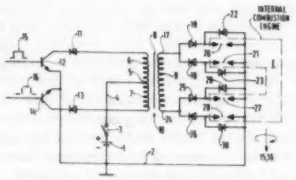
Klaus Heyke, Reutlingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jan. 22, 1985, Ser. No. 693,259

Claims priority, application Fed. Rep. of Germany, Mar. 30, 1984, 3411845

Int. Cl.[4] F02P *1/00*

U.S. Cl. 123—643 2 Claims



1. In combination with a multi-cylinder internal combustion engine (ICE),

an ignition system having an ignition coil (10) including a primary winding (6, 7) and a secondary winding (9);

means (12,14) connected to the primary winding and selectively energizing the ignition coil and, upon interruption of energization, providing spark pulse outputs at secondary terminals (17, 24) of a secondary winding of a polarity which depends on energization of a respective one of the primary windings (6,7);

at least two spark plugs (20, 21, 27, 28) connected to the respective secondary terminals (17, 24) of the secondary winding;

and reversely polarized diodes (18, 19; 25, 26) connected in series between the spark plugs and the respective secondary terminals of the secondary winding,

and comprising, in accordance with the invention,

means for preventing misfire of the engine by suppression of undesired firing or spark discharge of a spark plug upon malfunction of at least one of said serially connected diodes (18, 19; 25, 26) by passage of energy by a malfunctioning serially connected diode including

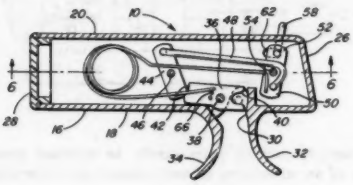
an additional diode (22, 23; 29, 30) connected in parallel across each of the spark plugs (20, 21; 27, 28) to thereby short-circuit current through the additional diode upon passage of energy by the malfunctioning serially connected diode in reverse direction of its normal current flow due to malfunction, and thereby prevent misfire of the engine.

4,556,041

BOW STRING GRIP AND RELEASE

Leo L. Prescott, Jr., 10401 Calle Trece, and Bryon C. Eddy, 10441 Calle Trece, both of Tucson, Ariz. 85748

Filed Jul. 1, 1983, Ser. No. 510,375
Int. Cl.⁴ F41B *5/00*
U.S. Cl. 124—35 A **2 Claims**



1. A bow string release including an elongated body for gripping in the hooked fingers of the user's bow string pulling hand and including a front side for opposing the phalanges of the user's hand between the first and second joints thereof and a first end for opposing the thumb of the user, a pair of guides carried by said front side and slightly spaced apart longitudinally of said body, said guides including forwardly divergent opposing surfaces and being spaced from and closer to said first end than the opposite end of said body, releasable bow string engaging anchor means carried by said body closely inwardly of the spacing between said guides and shiftably supported from said body for movement between bow string anchoring and bow string release positions, and release means operative from adjacent said first end by the user's thumb for releasing the bow string anchor means, said releasable bow string engaging anchor means including a lever pivotally mounted in said body intermediate its opposite ends and including an endwise outwardly opening transverse notch in one end, said lever being angularly displaceable between a bow string release position with said notch opening endwise outwardly between said base ends of said guides and a bow string anchoring position with said notch opening in a direction transverse to said guides and extending longitudinally of said body, latch means mounted in said body for movement between latching and unlatched positions and operable to latch said lever in the bow string anchoring position when in the latching position and to release said lever for movement thereof to the release position when in the unlatched position, single spring means operably connected with said latch means and said lever yieldingly biasing said latch means toward said latching position and said lever toward said bow string release position, and latch means release structure disposed exteriorly of said body adjacent said first end for engagement by the thumb of a user to shift said latch means toward the unlatching position thereof and to thereby release said lever for movement toward the bow string release position.

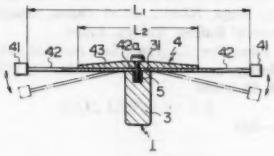
4,556,042

STABILIZER FOR ARCHERY BOWS

Tadao Izuta, Shizuoka, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Japan

Filed Jan. 25, 1983, Ser. No. 460,848
Claims priority, application Japan, Jan. 29, 1982, 57-11087
Int. Cl.⁴ F41B *5/00*
U.S. Cl. 124—89 **6 Claims**

1. An improved stabilizer for an archery bow having a handle raiser, said stabilizer comprising a pair of flexible arms attached at their proximal ends to the target side surface of a handle raiser of an archery bow and extending symmetrically and laterally with respect to said handle raiser from said proximal ends in an arrangement flexible in the shooting direction, said arms accompanied at their distal ends with masses, and a rigid backing centrally attached to the target side surface of said flexible arms overlying said proximal ends, said rigid backing extending laterally from said handle raiser and overlying a portion of the target side surface of said flexible arms for



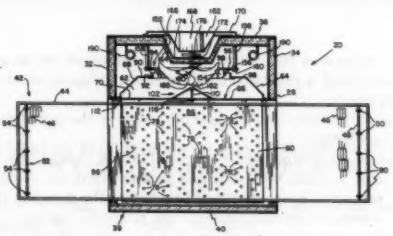
restricting the flexing of said arms in a direction towards said rigid backing.

4,556,043

AIR DELIVERY SYSTEM FOR AN IMPINGEMENT FOOD PREPARATION OVEN INCLUDING A CONICAL AIR DEFLECTOR

Ronald E. Bratton, Fort Wayne, Ind., assignor to Lincoln Manufacturing Company, Inc., Fort Wayne, Ind.

Filed Sep. 17, 1984, Ser. No. 650,843
Int. Cl.⁴ A21B *1/00*
U.S. Cl. 126—21 A **12 Claims**



1. An impingement food preparation oven, comprising:
an enclosure including a cooking chamber adapted for cooking a food product therein,
means in said cooking chamber adapted for supporting a food product,
a plurality of duct members mounted in said cooking chamber and spaced apart from said supporting means, said duct members including a plurality of nozzles positioned to direct a plurality of streams of air towards said supporting means,
a plenum in said enclosure and connected to said duct members to provide a flow of air thereto, said plenum having a front wall with a plurality of openings connected to respective said duct members and a backwall with an opening therein,
means in said enclosure for heating the flow of air before it enters said plenum,
a ring-like member having a peripheral sidewall and being closing fitted in said backwall opening, and
a rotatable scoop-type fan having a plurality of generally tear-drop shaped blades and positioned in said peripheral sidewall of said ring-like member for drawing a flow of heated air from said enclosure into said plenum, each said blade having a leading edge portion that tapers to a point in the direction of rotation of said fan and a trailing row portion disposed at a given pitch angle, whereby upon rotation of said fan a flow of heated air is created by each said blade leading edge portion scooping a portion of air and its respective said blade trailing row portion forcibly moving the portion of air in a substantially axial direction towards said plenum front wall,

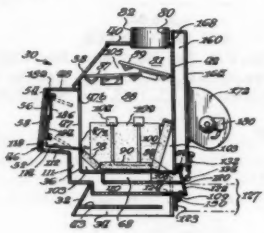
said plenum front wall including a generally flat surface having a conically-shaped projection projecting therefrom in a generally axial direction towards said fan, said conically-shaped projection being disposed relative to said fan so that the conical surface thereof smoothly and uniformly directs the flow of heated air from said fan into said duct members and out said nozzles thereby providing a uniform cooking temperature for a food product on said supporting means.

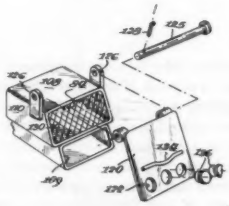
4,556,044

WOOD AND COAL BURNING STOVE

Gerald H. Barsness, 4507 W. Ducharm, Peoria, Ill. 61607, and Richard A. Kleine, 6017 Trenton La., Peoria, Ill. 61614

Filed Jun. 18, 1982, Ser. No. 390,028
Int. Cl.[4] F24C 1/14
U.S. Cl. 126—77 **49 Claims**





1. A stove for burning solid fuel comprised of flammable solids that produce one or more flammable gases when heated and burned, said stove having at least two modes of operation, the second mode of operation providing a lower level of combustion than the first mode, which stove comprises:

(a) a fire grate for receiving pieces of said solid fuel;

(b) a stove cabinet surrounding said grate and providing (i) a fire chamber above said grate, said fire chamber being defined by said fire grate, generally vertical side walls, and an upper wall, and (ii) an ash collecting space directly beneath said fire grate,

the walls of said stove cabinet defining:

(i) a fuel access opening for depositing said pieces of solid fuel upon said grate,

(ii) first, lower level air inlet means adjacent said fire grate, said first air inlet means having a finite plurality of predetermined, fixed air transmitting conditions and no other air transmitting conditions, one of said predetermined, fixed air transmitting conditions being a maximum air transmitting condition, and one being less than said maximum air transmitting condition, said air inlet means providing communication between the air surrounding said stove and said fire chamber adjacent the bottom of said chamber,

(iii) second air inlet means located above said first, lower level air inlet means in a wall of the cabinet that defines said fire chamber, the path by which air flows from outside the stove through said second air inlet means into said fire chamber being entirely separate from the path by which air flows from outside said stove through said first air inlet means into said fire chamber,

(iv) an exhaust outlet opening communicating with the top portion of said fire chamber, and

(v) an ash removal opening communicating with said ash collecting space below the fire grate;

(c) air metering means providing communication at all times between the air surrounding said stove and said second air inlet means, said air metering means having a finite plurality of predetermined, fixed air transmitting conditions and no other air transmitting conditions, the first of said predetermined, fixed air transmitting conditions being a maximum air transmitting condition, and the second of said predetermined, fixed air transmitting conditions allowing the passage of a smaller amount of air, and when another predetermined, fixed air transmitting condition is present in said air metering means in addition to said first two conditions, such other condition allowing the passage to a still smaller amount of air,

said air metering means including preselector means having a finite plurality of predetermined positions available for selection by the user of the stove, movement of said preselector means into one of its said predetermined positions selecting a corresponding one of said finite plurality of predetermined, fixed air transmitting conditions for said air metering means, said air metering means having no ohter air transmitting conditions besides said finite plurality of predetermined, fixed air transmitting conditions so long as said preselector means is placed in no other position than one of its said predetermined positions,

said stove cabinet being substantially airtight except for said fuel access opening, said first, lower level air inlet means, said second air inlet means, said exhaust outlet opening and said ash removal opening,

said (i) first, lower level air inlet means in its said predetermined, fixed, maximum air transmitting condition, (ii) second air inlet means, and (iii) air metering means in its said predetermined, fixed, maximum air transmitting condition taken together with said two air inlet means being of a size to introduce air into said fire chamber for said first mode of operation,

said (i) first, lower level air inlet means in its said predetermined, fixed, less-than-maximum air transmitting condition, (ii) second air inlet means, and (iii) air metering means in one of its said predetermined fixed, less-than-maximum air transmitting conditions taken together with said two air inlet means being of a size to introduce air into said fire chamber for said second mode of operation;

(d) covers for:

(i) said fuel access opening,

(ii) said first, lower level air inlet means, and

(iii) said ash removal opening, respectively,

to produce, except for any opening present when said first, lower level air inlet means is in its said predetermined, fixed less-than-maximum air transmitting condition, substantially airtight closures of said two openings and said lower level air inlet means,

said fuel access opening, said first, lower level air inlet means, and said ash removal opening being selectively opened or closed independently of each other; and

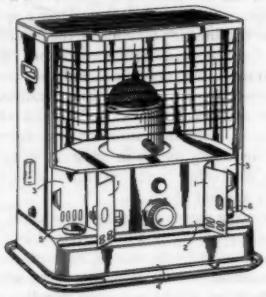
(e) temperature responsive control means for simultaneously placing said lower level air inlet means and said air metering means in their said respective predetermined, fixed, maximum air transmitting conditions automatially in response to a predetermined minimum temperature.

4,556,045

REFLECTION TYPE KEROSENE STOVE

Hideo Nishikawa; Kenzo Okamoto, both of Osaka; Koichi Sakai, Moriguchi, and Fumihiko Kitada, Neyagawashi, all of Japan, assignors to Imanishi Kinzoku Kogyo Kabushi Kaisha, Osaka, Japan

Continuation of Ser. No. 561,979, Dec. 16, 1983, abandoned.
This application Feb. 21, 1985, Ser. No. 703,814
Claims priority, application Japan, Jun. 22, 1983, 58-094997
Int. Cl.[4] F24C *5/04*
U.S. Cl. 126—96 2 Claims



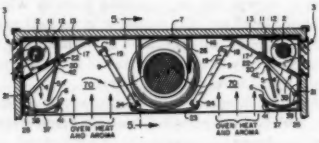
1. In a reflection type kerosene stove having a tank to store kerosene fuel together with a burner mantle assembly and control means for regulating fuel flow, the improvement to such a stove comprising a base forming the fuel tank, said base having a generally rectangular shape with end, back, rear and top walls and a front wall, a vertically extending front panel above said tank base and oriented parallel to said front wall of said tank base, a stove superstructure above said base and having end and back walls and coextensive with said base end and back walls and cooperating with said front panel and with said front and top walls to define recessed spaces adjacent the corners of said stove superstructure beside said front panel, fuel inlet means in one such recessed space for filling said fuel tank, fuel meter means in the other such recessed space to indicate the fuel quantity in such tank, covers for said recessed spaces adjacent the corners of said stove superstructure, each of said covers having an L-shaped configuration with angularly related cover panel parts, one of each such cover parts oriented in the plane of said front panel when the cover is closed, hinges connecting said covers to said front panel for selectively enclosing said corner defined spaces.

4,556,046

HOOD FOR OVEN IN PIZZA DELIVERY VEHICLE

Leonard F. Riffel, Wichita, and Ricardo Barrera, Rose Hill, both of Kans., assignors to Pizza Hut, Inc., Wichita, Kans.

Filed Apr. 12, 1984, Ser. No. 599,496
Int. Cl.[4] F24C *15/20*
U.S. Cl. 126—299 D 22 Claims



1. In a pizza preparation and delivery vehicle having first and second spaced side walls and a back wall adjoining said side walls and extending substantially perpendicular thereto, the improvement comprising:

a hood, comprising:

first and second intake air vents disposed at the respective first and second side walls of the vehicle such that air can be drawn from outside the vehicle to inside the vehicle through the first and second intake air vents;

first and second intake air fans positioned adjacent to the first and second intake air vents respectively and operative to draw air into the hood through the first and second intake air vents; and

an exhaust fan positioned between said first and second intake air fans, operative to exhaust air out of the hood;

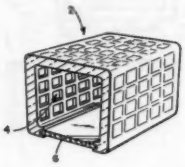
said first and second intake air fans and said exhaust fan cooperating to form an air flow from the first and second side walls and through the back wall of the vehicle.

4,556,047

SOLAR FURNACE

Philippe A. Clavier, P.O. Box 568, Bodega Bay, Calif. 94923

Division of Ser. No. 351,018, Feb. 22, 1982, Pat. No. 4,508,099.
This application Jan. 15, 1985, Ser. No. 691,758
Int. Cl.[4] F24J *3/02*
U.S. Cl. 126—400 11 Claims



1. An element for a solar furnace comprising a body including a wall member, a portion of which is substantially transparent to solar radiation wavelengths shorter than about 2 microns, and a panel having a surface spaced from and facing said transparent portion, said panel having a depth of material at said surface, which material consists essentially of zinc metal, said material covered surface being uncovered facing said wall member, said depth of said zinc metal being sufficient to be opaque to incident solar radiation and absorptive of said substantial portion of its energy, and having an emissivity of less than 0.04 at 20 degrees C., the said surface and wall member at least partially defining a cavity formed by said body which is impervious to atmospheric gases, said cavity being substantially evacuated, and said panel being adapted for transfer of heat therefrom.

4,556,048

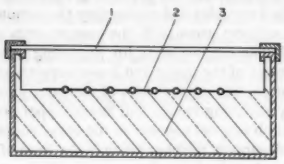
SOLAR HEAT COLLECTOR

Masao Maki, Nabari; Yasunori Kaneko, Nara, and Hiroshi Fukuda, Yamatokoriyama, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

PCT No. PCT/JP83/00268, § 371 Date Apr. 13, 1984, § 102(e) Date Apr. 13, 1984, PCT Pub. No. WO84/00804, PCT Pub. Date Mar. 1, 1984
PCT Filed Aug. 16, 1983, Ser. No. 606,773
Claims priority, application Japan, Aug. 18, 1982, 57-143923; Dec. 1, 1982, 57-211560
Int. Cl.[4] F24J *3/02*
U.S. Cl. 126—417 11 Claims

1. A solar heat collector comprising a heat collecting panel principally composed of a polyolefin resin base, a first coating layer formed on said polyolefin resin base, and a second coating layer having solar selective absorptivity formed on said

first coating layer; wherein said first coating layer comprises one or more resins selected from thermoplastic acrylic resins



and alkyd resins in combination with chlorinated polyolefin resins, epoxy resins and a metallic powder.

4,556,049

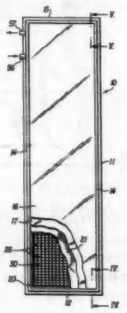
INTEGRATED SOLAR COLLECTOR

Dimiter I. Tchernev, 9 Woodman Rd., Chestnut Hill, Mass. 02167

Continuation-in-part of Ser. No. 11,689, Feb. 12, 1979, which is a continuation-in-part of Ser. No. 710,609, Aug. 2, 1976, Pat. No. 4,138,850, which is a division of Ser. No. 520,808, Nov. 2, 1974, Pat. No. 4,034,569. This application May 26, 1981, Ser. No. 267,074

Int. Cl.⁴ F24J *3/02*

U.S. Cl. 126—429 **15 Claims**



1. A solar collector panel which comprises: a first rigid sheet of impervious material; a second rigid sheet of impervious material spaced above and parallel to said first sheet; edge means connecting the peripheries of said sheets to form a hermetically sealed first space between said sheets; cellular means in said first space extending between said sheets and forming a plurality of cells therein; zeolite material filling said cells from said first sheet to proximate said second sheet; vapor passage means between said cells whereby gas and vapor in said first space can move between said cells to be desorbed and adsorbed by said zeolite material; a refrigerant in said space at a pressure less than atmospheric pressure; a container defining a sealed second space in vapor passage communication with said first space disposed under said first space for receiving gas and vapor desorbed by said zeolite material; heat exchange means in a heat exchange relationship with the interior of said second space for performing the function of condensing vapor or gas refrigerant received in said second space which has been desorbed from said zeolite material at a first temperature and evaporating said refrigerant condensate in said second space to be adsorbed by said zeolite material at a second temperature lower than said first temperature.

4,556,050

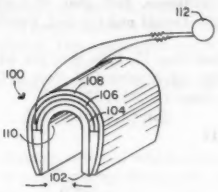
ARTIFICIAL SPHINCTER INCLUDING A SHAPE MEMORY MEMBER

Darel E. Hodgson, 170 Parkside Dr., Palo Alto, Calif. 94306, and John F. Krumme, 87 Upenuf Rd., Woodside, Calif. 94062

Filed May 2, 1984, Ser. No. 606,408

Int. Cl.⁴ A61B *5/00*

U.S. Cl. 128—1 R **30 Claims**



1. An artificial sphincter comprising:

a shape memory implantable about a substance-carrying vessel in a living body; and

deforming for urging said shape memory member to a deformed configuration from a memory configuration thereof;

said shape memory being heat recoverable to the memory configuration thereof after being deformed therefrom by said deforming means, and

heater means for heating said shape memory member to heat recoverable temperatures;

said shape memory member at least partially clamping the vessel in one of said configurations.

4,556,051

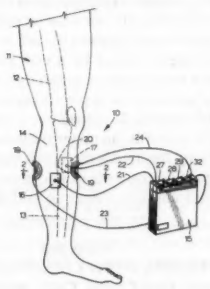
METHOD AND APPARATUS FOR HEALING TISSUE

Donald D. Maurer, Anoka, Minn., assignor to EMPI, Inc., Fridley, Minn.

Filed Nov. 5, 1982, Ser. No. 439,357

Int. Cl.⁴ A61N *1/32, 1/42*

U.S. Cl. 128—1.5 **28 Claims**



1. An apparatus for promoting healing of injured tissue within a region of a living body comprising: electrode means for transcutaneously applying a current to the body which passes through the region, coil means for producing a magnetic field which passes through the region, electric current generator means for providing electric currents to said electrode means and to said coil means, and circuit means for coordinating the electric currents provided to the electrode means and the coil means to produce simultaneous presence and interaction within the region of the current from the electrode means and the magnetic field from the coil means with a spatial and polarity relationship which produces unidirectional resultant current in the region of the injured tissue in a direction gener-

ally perpendicular to the current from the electrode means and generally perpendicular to the magnetic field that enhances the healing of the injured tissue.

4,556,052

MEDICAL INSTRUMENT WITH INTERNAL LIGHT SOURCE FOR ILLUMINATING BODY CAVITIES

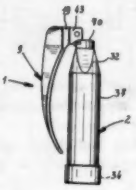
Rolf Müller, Tuttlingen, Fed. Rep. of Germany, assignor to Gustav Mueller GmbH und Co. KG, Tuttlingen, Fed. Rep. of Germany

Filed May 17, 1984, Ser. No. 611,404

Claims priority, application Fed. Rep. of Germany, May 17, 1983, 3317831; May 17, 1983, 3317832

Int. Cl.⁴ A61B *1/06*

U.S. Cl. 128—11 **20 Claims**



1. A medical instrument for the exploration of anatomical cavities, comprising:

a hollow upright handle;

an elongate speculum pivoted to an upper end of said handle for selective swinging into an idle position alongside said handle and a substantially horizontal working position generally perpendicular thereto;

a light source and an associated generator of electrical energy disposed next to each other in said handle, said light source being positioned at said upper end for emitting light from the top of said handle;

cam means on said speculum effective in said working position to close an energizing circuit connecting said light source across said generator; and

light-guiding means in said speculum extending in said working position from the vicinity of said top toward a tip of said speculum in a lighttight and externally smooth-surfaced channel bounded by a web and a lower transverse flange of a first profile of generally Z-shaped cross-section and by a web and an upper transverse flange of a second profile of inverted-L-shaped cross-section closely adjoining said first profile, an upper transverse flange of said first profile being flush with the upper transverse flange of said second profile, the web of said second profile resting on the lower transverse flange of said first profile.

4,556,053

KNEE ORTHOSIS WITH LEG STABILIZING MEANS

George P. Irons, West Covina, Calif., assignor to United States Manufacturing Company, Pasadena, Calif.

Filed Feb. 8, 1984, Ser. No. 578,229

Int. Cl.⁴ A61F *5/00*

U.S. Cl. 128—80 C **19 Claims**

1. A knee brace comprising:

upper and lower limb support members;

means for securing the upper and lower limb support members to the upper and lower legs of a patient above and below the knee joint;

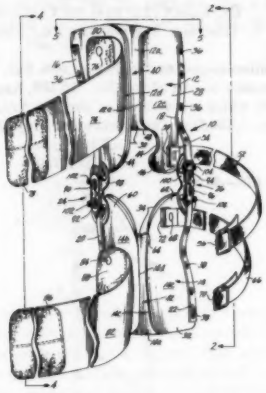
a pair of rigid upper support arms extending down from the upper limb support member for extending along opposite sides of the upper leg to remote ends adjacent lateral and medial sides of the knee joint;

a pair of rigid lower support arms extending upwardly from the lower limb support member for extending along opposite sides of the lower leg to remote ends adjacent lateral and medial sides of the knee joint;

medial and lateral pivot means defining an axis of rotation through the knee joint and connecting the remote ends of the upper support arms with the remote ends of corresponding lower support arms for providing relative pivotal movement of the upper and lower support arms adjacent the lateral and medial sides of the knee joint;

means rigidly attaching medial and lateral upper portions of the upper limb support member to the upper support arms;

the upper limb support member being in the form of a generally U-shaped and elongated upper cuff for wrapping around the patient's upper leg above the knee joint, with bendable elongated lateral and medial lower portions of the upper cuff freely extending downwardly from the rigid attaching means for being movable toward an open central region of the brace away from the rigid upper support arms and into contact with the lateral and medial sides of the upper leg immediately above the bony prominences at the lateral and medial sides of the knee joint;



tensioning means attached to such bendable lower portion of the upper cuff at an elevation spaced above said axis of rotation for being wrapped around the patient's leg and around the upper support arm on the opposite side of the brace and then tensioned using the opposite support arm of the brace as a means of applying leverage to the tensioning means for pulling the lateral and medial bendable lower portions of the upper cuff inwardly away from the adjacent support arms and into pressure contact with the lateral and medial sides of the leg immediately above the bony prominences at the lateral and medial sides of the upper leg above the knee joint; and

means for retaining tension applied by the tensioning means to maintain the inward pressure contact applied by the bendable lower portions of the upper cuff for suspending the knee brace on the upper leg to prevent rotation of the knee brace about the axis of the leg and to prevent the knee brace from slipping downwardly on the leg.

4,556,054

ANKLE ORTHOSIS

Stephen G. Paulseth, 2028 14th St., Apt. E, Santa Monica, Calif. 90405

Filed Nov. 21, 1983, Ser. No. 554,063

Int. Cl.⁴ A61F *3/00*

U.S. Cl. 128—80 H **5 Claims**

1. An ankle orthosis adapted for installation on an ankle, comprising:

a cuff, adapted for fastening around the leg above the ankle;

a foot plate, adapted to be positioned beneath the tarsal bones of the foot;

means connecting the cuff and the foot plate positioned so as to extend down the lateral side of the ankle when the orthosis is worn on the ankle, the length of said connecting means in relation to the distance between the cuff and the foot plate being such as to restrict inversion of the ankle, said connecting means comprising a non-elastic strap; and

a resilient bumper attached to the lateral side of the cuff and protruding outwardly therefrom, said connecting means overriding and being displaced by said bumper such that said non-elastic strap can only be straightened by compressing said bumper between said connecting means and the ankle, whereby ankle inversion is progressively resisted by virtue of the resilience of the bumper, and whereby ankle inversion is substantially prevented once said progressive resistance has been overcome and said non-elastic strap has been straightened.

4,556,055

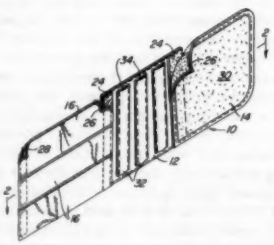
COLD COMPRESS

Francis J. Bonner, Jr., 136 Biddulph Rd., Radnor, Pa. 19087

Filed Oct. 26, 1984, Ser. No. 665,265

Int. Cl.[4] A61F *7/02*

U.S. Cl. 128—82.1 **12 Claims**



1. A compress comprising a bandage member and a strap element, said bandage member including an elongated layer of closed cell foam polymeric material sandwiched between and bonded to layers of fabric, one of said layers of fabric being absorbent with respect to aqueous liquids and adapted to be in contact with a body part and means at one end of the bandage member adapted to releasably engage with mating structure on the strap element, said strap element comprising a plurality of elongated elastic straps, one end of said straps being adapted to be secured to said bandage member and the other end of said straps having said mating structure.

4,556,056

TRANSPARENT FLUID BANDAGE MATERIAL AND THE PREPARATION AND USE THEREOF

Herbert Fischer, Burg; Botho Kickhöfen, Freiburg, and Eckehard Vaubel, Berlin, all of Fed. Rep. of Germany, assignors to Max-Planck-Gesellschaft zur Forderung der/Wissenschaften e.V., Gottingen, Fed. Rep. of Germany

Continuation of Ser. No. 284,266, Jul. 17, 1981, abandoned, which is a continuation of Ser. No. 74,613, Sep. 12, 1979, abandoned, which is a continuation-in-part of Ser. No. 880,524, Feb. 23, 1978, abandoned. This application Jun. 9, 1983, Ser. No. 501,056

Claims priority, application Fed. Rep. of Germany, Jun. 3, 1977, 2725261

Int. Cl.[4] A61L *15/00*

U.S. Cl. 128—156 **44 Claims**

1. Transparent dressing material which is especially useful for the treatment of wounds, comprising a dry, swellable clear film of hydrophilic, organic transparent gel in the form of a sheet or strip and wherein said gel comprises (a) at least one of a gellable polysaccharide, protein or polypeptide and (b) a hydrophilic polymer which has been prepared by polymerization in the presence of said component (a).

4,556,057

CANCER DIAGNOSIS DEVICE UTILIZING LASER BEAM PULSES

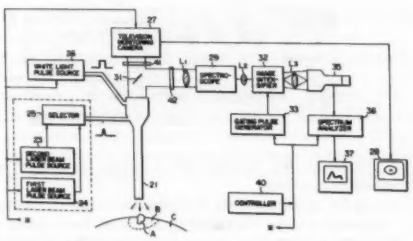
Teruo Hiruma; Atsushi Honma; Tooru Hirano; Yutaka Tsuchiya, all of Hamamatsu; Yoshihiro Hayata, Tokyo; Katsuo Aizawa, Tokyo; Harubumi Kato, Tokyo, and Keiji Kainuma, Tokyo, all of Japan, assignors to Hamamatsu TV Co., Ltd., Hamamatsu, Japan

Filed Mar. 11, 1983, Ser. No. 474,302

Claims priority, application Japan, Aug. 31, 1982, 57-151404

Int. Cl.[4] A61B *6/08*

U.S. Cl. 128—303.1 **7 Claims**



1. Apparatus for diagnosing and treating cancer wherein a photosensitive material having an affinity to the focuses of cancer has been absorbed by said cancer, comprising

an endoscope including a light pipe for transmitting light to said focuses of cancer and an image guide for observation of said focuses;

a first laser beam pulse source having a wavelength suitable for treatment of said focuses of cancer;

a second laser beam pulse source having a wavelength suitable for diagnosis of said focuses of cancer;

selector means for selectively coupling light from either said first or said second laser beam pulse source to the light pipe of said endoscope, light from the selected laser beam source impinging on said focuses of cancer;

a third white light pulse source having a wavelength suitable for observation of said focuses of cancer;

a light splitter optically coupled to said endoscope for receiving images of said focuses of cancer from the image guide of said endoscope and transmitting said image in two directions;

a spectroscope coupled to said light splitter, said spectroscope receiving light transmitted in one direction by said

light splitter and generating a spectral response corresponding to two spaced fluorescent peaks emitted by said focuses of cancer when light from said second laser beam pulse source impinges on said focuses of cancer;

an imaging device coupled to the output of said spectroscope for detecting said spectral response;

spectrum analyzer means coupled to the output of said imaging means for processing the output thereof;

a display device coupled to the output of said spectrum analyzer means for graphically displaying the output of said spectrum analyzer means;

a television monitoring device coupled to said light splitter, said television monitoring device receiving light transmitted in the other direction by said light splitter; and

a controller coupled to said second laser beam pulse source and to said third white light pulse source, said controller controlling the emission of light from said second and third pulse sources so that said third white light pulse source emits light during diagnosis only in the interval between the emission of pulses from said second laser beam pulse source, and controlling said imaging device so that said imaging device operates synchronously with the emission of light by said second laser beam pulse source.

4,556,058

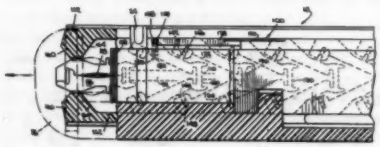
APPARATUS FOR LIGATION AND DIVISION WITH FIXED JAWS

David T. Green, Norwalk, Conn., assignor to United States Surgical Corporation, Norwalk, Conn.

Continuation-in-part of Ser. No. 524,078, Aug. 17, 1983, abandoned, which is a continuation-in-part of Ser. No. 480,436, Mar. 30, 1983, abandoned. This application Jan. 12, 1984, Ser. No. 570,213

Int. Cl.[4] A61B *17/12*

U.S. Cl. 128—305 **25 Claims**



1. Apparatus for ligating and dividing an organic tissue structure comprising:

means for simultaneously applying two clips of plastic-like material around the tissue structure at two spaced apart locations along the tissue structure to ligate the tissue structure at the locations of the clips, said means including first and second substantially parallel laterally spaced clip applying assemblies, each assembly containing a respective one of said clips, and each assembly including (1) a pair of jaws rigidly fixed relative to one another forming a discharge opening and disposed on respective opposite sides of the tissue structure and (2) means for forcing the associated clip completely through the jaws of the assembly so that the clip closes one to the fixed relationship of the jaws as it is forced through said discharge opening; and

means for cutting the tissue structure between the clips.

4,556,059

SPRING OPERATED TRACHEOTOME

Howard Adamson, Jr., 5813 NW. 18 Ct., Margate, Fla. 33063

Filed Sep. 3, 1982, Ser. No. 414,893

Int. Cl.[4] A61B *17/34*

U.S. Cl. 128—305.3 **9 Claims**

4. A tracheotome for performing a tracheostomy, and passing a breathing tube into a patient, comprising:

injector means for defining a passage for air and for insertion therethrough of the breathing tube; and

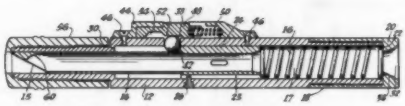
housing means for retaining, triggering and propelling said injector means for adjustable insertion of said injector means into said trachea;

said injector means comprising an elongated hollow cannula with two opposite open ends forming an internal channel which defines a passage for air and for insertion therethrough of the breathing tube, one open end of said cannula having an oblique edge with respect to the longitudinal axis of said hollow cannula defining a cutting blade;

the internal channel of said cannula having a portion which is curved with respect to the longitudinal axis of said hollow cannula adjacent to said oblique edge adapted to direct the breathing tube when inserted therethrough into the trachea of a patient;

said cannula comprising a rear end portion adjacent the other open end of said hollow cannula and a front end portion adjacent the one open end of said hollow cannula, said rear end portion having a greater diameter than a front end portion of said cannula, said cannula defining an outer annular protruding shoulder at the intersection of said front and rear end portions;

said housing means comprising an elongated hollow housing with two opposite open ends forming an internal channel adapted to slidably receive said injector means therein and providing a passage through which air and the breathing tube may pass to said injector means received therein, said channel comprising a rear portion adjacent one open end of said housing and a front portion adjacent the other open end of said housing, said front portion having a smaller diameter than said rear portion of said channel;



said front portion adapted to slidably accomodate said front end portion of said injector means, said rear portion adapted to slidably accomodate said rear end portion of said injector means, said channel defining a protruding structural stop at the intersection of said rear channel portion and said front channel portion adapted to impinge with the protruding shoulder of said injector means;

said housing having blade end cap means for defining an exit for said injector means from said housing adjustably connected to the other open end of said housing by thread means, said housing having injector spring cap means for defining an entrance for air and the breathing tube into the housing connected to the one open end of said housing by thread means, said front end portion of said injector means being substantially longer than the front portion of said housing means, said rear end portion of said injector means being substantially shorter than the rear portion of said housing, said injector means positioned in said internal channel of said housing with said front end portion of said injector means in slidable cooperation with said front channel portion of said housing, said rear end portion in slidable cooperation with said rear channel portion of said housing and said protruding shoulder in slidable cooperation with said rear channel portion of said housing;

said housing means further including triggering means and propelling means, said triggering means connected to said injector means for normally retaining said injection means within said housing and for selectively triggering propulsion of said injector means by said propelling means; and

said propelling means connected to said injector means for providing upon the selective triggering of said triggering means a propelling force to said injector means to cause said injector means to slide forward within said internal

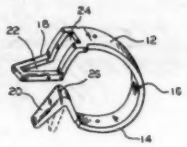
channel until the front end portion forcibly extends from the other open end of said housing means and adjustable distance to cut and penetrate into said trachea and said protruding shoulder impinges against said structural stop.

4,556,060

SURGICAL CLIP

Alfred R. Perlin, Highland Park, Ill., assignor to Metatech Corporation, Northbrook, Ill.

Filed Sep. 30, 1982, Ser. No. 429,170
Int. Cl.[4] A61B *17/12*
U.S. Cl. 128—325 **10 Claims**



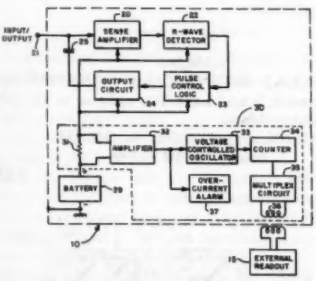
9. A surgical clip of unitary construction comprising an elongated body terminating at both ends in outwardly projecting jaw members, a passage formed integral with and through said body adjacent a first one of said jaws adapted to receive the looped remote second jaw of the clip to essentially form a looped body with said jaws projecting outwardly therefrom in mutually juxtaposed relationship, said body being integrally hinged at its mid-section, said first jaw including a slot, said slot being a longitudinal extension of said passage, said slot and said second jaw being cooperatively tapered longitudinally whereby said slot is adapted to nestingly accommodate said second jaw and an undercut is formed at the juncture of said body and said remote jaw adapted to allow said remote jaw to be cocked whereby assembly of said clip is facilitated.

4,556,061

CARDIAC PACER WITH BATTERY CONSUMPTION MONITOR CIRCUIT

Francisco J. Barreras, and Ira R. Baker, both of Miami, Fla., assignors to Cordis Corporation, Miami, Fla.

Continuation of Ser. No. 409,329, Aug. 18, 1982, abandoned. This application Mar. 12, 1985, Ser. No. 710,531
Int. Cl.[4] A61N *1/36*
U.S. Cl. 128—419 PT **5 Claims**



1. A battery-operated implantable pacer comprising, in combination:

pacer circuit means operable from a unidirectional current source for supplying pacing pulses to a pacer lead;

means including a battery for supplying unidirectional current to said pacer circuit means;

current sensing means coupled between said battery and said pacer circuit means for developing a demand signal indicative of the current being drawn from said battery;

oscillator means responsive to said demand signal for developing a plurality of pulses each indicative of the consumption of a predetermined unit of charge by said pacer circuit means from said battery;

counter means responsive to said pulses for developing a multi-digit output signal continuously indicative of the number of units of charge consumed from said battery, said counter means including a plurality of individual counter elements providing respective digits of said output signal; and

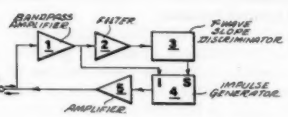
telemetry circuit means responsive to said output signal for providing at a remote location within said range of battery charge states an indication of the total charge consumed from said battery.

4,556,062

CARDIAC STIMULATOR WITH FREQUENCY SELF-REGULATION THROUGH THE ELECTROCARDIOGRAPHIC T WAVE

Gino Grassi, via Imbriani, 21, 50019 Sesto Fiorentino (Firenze); Leonardo Cammilli, Florence; Luciano Alcidi, Florence, and Paolo Marconi, Florence, all of Italy, assignors to Gino Grassi, Sesto Fiorentino, Italy

Filed Nov. 4, 1983, Ser. No. 548,775
Claims priority, application Italy, Nov. 5, 1982, 9537 A/82
Int. Cl.[4] A61N *1/30*
U.S. Cl. 128—419 PG **22 Claims**



1. A method for controlling the stimulation pulse rate of a cardiac pacemaker, comprising the steps of:

sensing T-wave repolarization signals from a subject using the pacemaker;

determining the slope of the sensed T-wave signals; and

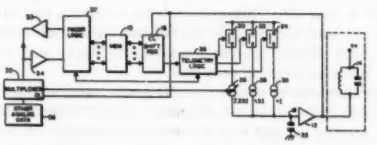
adjusting the stimulation pulse rate of the pacemaker in proportion to the determined slope of the sensed T-wave signals, thereby adjusting the stimulation pulse rate of the pacemaker to metabolic requirements of the subject user.

4,556,063

TELEMETRY SYSTEM FOR A MEDICAL DEVICE

David L. Thompson, Fridley; Robert M. Bennett, Ham Lake, and Glenn M. Roline, Anoka, all of Minn., assignors to Medtronic, Inc., Minneapolis, Minn.

Continuation of Ser. No. 418,925, Sep. 16, 1982, abandoned, which is a continuation of Ser. No. 194,807, Oct. 7, 1980, abandoned. This application Dec. 7, 1984, Ser. No. 679,152
Int. Cl.[4] A61N *1/00*
U.S. Cl. 128—419 PT **1 Claim**



1. In a transmitter for transmitting signals from an implantable medical device which are representative of either analog or digital values comprising a signal controlled variable frequency oscillator means having a control terminal, signal ap-

plication means for selectively presenting information signals representative of said digital and analog values to said control terminal to vary the frequency of said oscillator means in response thereto relative to a nominal output frequency of said oscillator means that exists when said information signals are not being supplied, a tank circuit and antenna means having a predetermined ringing frequency of oscillation when pulsed with energy, and drive circuit means coupled to said oscillator means and to said tank circuit and antenna means for supplying pulses of energy to said tank circuit and antenna means at a rate that is proportional to the output frequency of said oscillator means whereupon said pulses are radiated from said tank circuit and antenna means as damped ringing signals; the improvement wherein said signal applicatiion means comprises a selectively activated digital signal means which in a first state provides a first digital current level signal to said control terminal that is representative of a digital "one" and in second state provides a second digital current level signal to said control terminal that is representative of a digital "zero", first and second sources of analog information, a selectively actuated analog signal means which, when selected provides either a first analog current level signal in accordance with the information content of said first source or a second analog current level signal in accordance with the information content of said second source, means for selecting either said first or said second analog current level signal and means for selectively adding said first digital current level signal to said first analog current level signal and for selectively adding said second digital current level signal to said second analog current level signal and means for providing said added current level signals to said control terminal.

4,556,064

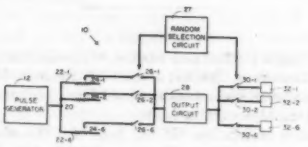
ELECTROTHERAPY ACUPUNCTURE APPARATUS AND METHOD

Bruce Pomeranz, 25 Governor's Rd., Rosedale, Ontario, Canada (M4W 2E9), and Norman Salansky, 6 Hearthstone Crescent, Willowdale, Ontario, Canada (M2R 1G3)

Filed Jan. 25, 1983, Ser. No. 460,969

Int. Cl.⁴ A61N *1/36*

U.S. Cl. 128—423 R **28 Claims**



1. Electrotherapy apparatus comprising:

(a) means for providing an electrical stimulating signal,

(b) at least three channels each for receiving said signal,

(c) at least three signal application means one connected to each channel and each adapted to apply said signal to a different location on a user,

(d) means for randomly switching said signal among said channels thus to switch said signal randomly from one location to another on said user, to reduce habituation of the brain of said user,

(e) and means associated with at least one of said means (a) and (b) for separately adjusting the intensity of the signal applied to each invividual signal application means to a selected constant intensity at such signal application means.

4,556,065

ELECTRODE STRUCTURE FOR ELECTRIC CONTACTOR

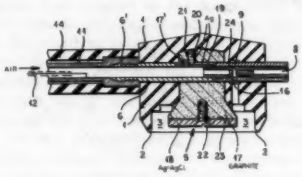
Heiner Hoffmann, Wippingen, Fed. Rep. of Germany, assignor to Ingeborg Niess Elektromedizinischee Apparate, Blaustein-Herringen, Fed. Rep. of Germany

Filed Jan. 11, 1984, Ser. No. 570,009

Claims priority, application Fed. Rep. of Germany, Jan. 12, 1983, 3300765

Int. Cl.⁴ H61B *5/04*

U.S. Cl. 128—639 **1 Claim**



1. A contactor for establishing electric communication with organic tissues comprising:

a nonmetallic cup-shaped housing with a mouth bounded by a tissue-engaging rim;

an electrode in said housing comprising a contact plate of coherent particles of a mixture of silver and silver salt recessed within said rim, said contact plate having an exposed surface accessible through said mouth, a body of solid graphite having an elongated portion received in said housing and an end portion wider than said elongated portion and integral therewith disposed in said mouth and abutting said plate, and a screw traversing said plate and threaded into said end portion for retaining said plate on said end portion, said elongated portion being formed with a transverse bore;

a metallic tube extending through said body and through said bore forming a contactor in conductive contact with said body and communicating with a source of high-pressure gas;

means communicating with said tube forming a Venturi nozzle establishing a reduced pressure zone communicating with said mouth and opening into the atmosphere; and

a further screw threaded into said body and bracing said tube in conductive contact with said body, said tube consisting of a ferrous metal having a silver coating at least in an area of conductive contact between said tube and said body, said further screw having a silver coating where it contacts said body.

4,556,066

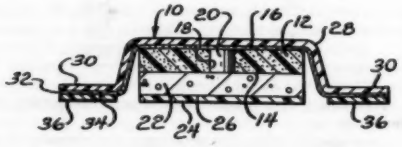
ULTRASOUND ACOUSTICAL COUPLING PAD

Carolyn M. Semrow, Island Lake, Ill., assignor to The Kendall Company, Boston, Mass.

Filed Nov. 4, 1983, Ser. No. 548,633

Int. Cl.⁴ A61B *10/00*

U.S. Cl. 128—660 **3 Claims**



1. An ultrasound acoustical coupling pad, comprising:

a circular planar retaining member comprising a sheet of

foam having a front surface free of adhesive on the front surface, a back surface, and a cut-out;

a doppler transducer received in said cut-out and with the retaining member in direct contact with the transducer;

a circular strip of acoustical gel covering the front surface of the retaining member;

a sheet releasably covering a front surface of the strip;

a backing member comprising a sheet of flexible material covering the entire back surface of the retaining member and having an exposed edge portion extending outwardly from the retaining member and strip peripherally around the retaining member and strip, said backing member having adhesive on a front surface thereof to secure the backing member to the back surface of the retaining member and secure the edge portion to the skin of a patient, said backing member overlying the transducer; and

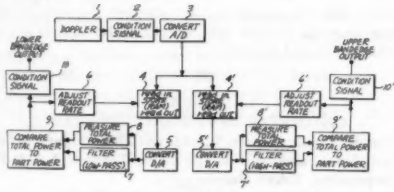
a release sheet releasably covering the adhesive on the edge portion of the backing member.

4,556,067

BANDWIDTH INDICATOR FOR DOPPLER BLOOD FLOWMETERS

D. Eugene Hokanson, Mercer Island, and Dennis C. Arneson, Renton, both of Wash., assignors to D. E. Hokanson, Inc., Issaquah, Wash.

Filed Jan. 10, 1984, Ser. No. 569,681
Int. Cl.[4] A61B *10/00*
U.S. Cl. 128—663 **20 Claims**



1. In a method for giving an indication of the frequency distribution of an analog, broadband, electrical input signal, the steps of:

sampling the input signal at a constant sampling rate and generating a series of discrete values representing the analog input signal in digital form;

storing the discrete values in memory;

reading out the discrete values from memory at a readout rate independent from the sampling rate and using the values read out of memory to construct a new, intermediate analog signal;

measuring the power P_a of one of the analog signals;

filtering the intermediate signal by passing only selected frequency components of such signal;

measuring the power P_b of the filtered intermediate signal;

comparing powers P_a and P_b; and

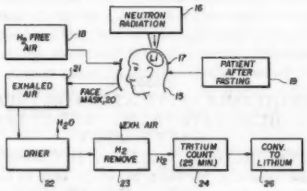
adjusting the readout rate of the discrete values from memory to maintain a preselected proportionate relationship between the power P_a and power P_b.

4,556,068

IN-VIVO MEASUREMENT OF LITHIUM IN THE BRAIN AND OTHER ORGANS

David Vartsky, Yavne, Israel; Lucian Wielopolski, Shirley, N.Y.; Anthony F. LoMonte, Wading River, N.Y.; Kenneth J. Ellis, Bayport, N.Y., and Stanton H. Cohn, Smithtown, N.Y., assignors to The United States of America as represented by the Department of Energy, Washington, D.C.

Filed Aug. 26, 1983, Ser. No. 526,762
Int. Cl.[4] A61K *43/00*
U.S. Cl. 128—719 **12 Claims**



1. An in-vivo method of measuring the amount of lithium present in tissue and organs of a beathing mammal, comprising the steps of:

(a) irradiating with neutrons a selected area of the lithium containing body of said mammal, thereby to produce tritium atoms in the body, by the nuclear reaction $^6Li(n,\alpha)T$ taking place, and to effect the production of elemental tritiated hydrogen (HT) gas within said body, as a reaction product of the tritium atoms with water present in the body;

(b) capturing air exhaled from said body during a designated time period following the neutron irradiation of said area;

(c) measuring the amount of HT gas in the captured air;

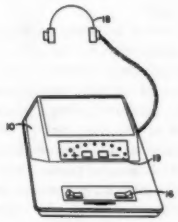
(d) normalizing the measurement of captured HT gas, and performing calculations to convert said measurement to a corresponding quantitive measurement of L_i, thereby to determine the amount of L_i present in said selected area of the body.

4,556,069

METHOD AND APPARATUS FOR MEASURING DIFFERENTIAL AUDITORY SYSTEM

Leslie W. Dalton, Jr., Mesilla Park; James A. Boehm, III, and William K. Cooper, both of Las Cruces, all of N. Mex., assignors to Energy Optics, Inc., Las Cruces, N. Mex.

Filed Mar. 15, 1983, Ser. No. 475,593
Int. Cl.[4] A61B *5/12*
U.S. Cl. 128—746 **14 Claims**



1. A method for measuring the differential processing time of the left and right auditory tracts of a human test subject and for indicating brain side dominance comprising:

introducing a repetitive, figure-ground pulsed aural stimulus into one ear of the human test subject,

introducing a phase related but otherwise identical stimulus into the other ear of the test subject,

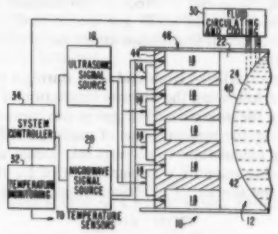
adjusting the phase relation of the two aural stimuli until the

human subject indicates an apparent centering of the sound and recording the magnitude and polarity of the resulting phase relation, thereby measuring differential processing time and indicating brain dominance.

4,556,070
HYPERTHERMIA APPLICATOR FOR TREATMENT WITH MICROWAVE ENERGY AND ULTRASONIC WAVE ENERGY

Victor A. Vaguine, Dallas, Tex.; Robert H. Giebeler, Jr., Cupertino, and Albert H. McEuen, Saratoga, both of Calif., assignors to Varian Associates, Inc., Palo Alto, Calif.

Filed Oct. 31, 1983, Ser. No. 547,307
Int. Cl.[4] A61N *1/00*
U.S. Cl. 128—804 8 Claims



7. An applicator for hyperthermia treatment of tissue by irradiation with microwave energy and ultrasonic wave energy comprising:

ultrasonic wave focusing means fabricated from material having relatively low microwave attenuation;

means for coupling microwave and ultrasonic wave energy between said focusing means and said tissue;

a microstrip antenna having a plurality of radiating elements mounted at the rear surface of the focusing means for transmission of microwave energy therethrough;

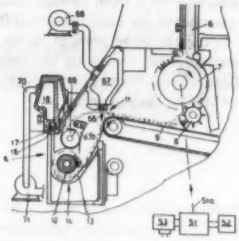
an array of ultrasound transducers mounted at the rear surface of the microstrip antenna so as to transmit ultrasonic wave energy through the microstrip antenna and the focusing means; and

housing means for mounting the ultrasonic wave focusing means, the coupling means, the microstrip antenna and the ultrasound transducers in fixed relative positions in a unitary assembly for hyperthermia treatment wherein the ultrasound transducers and the microstrip antenna are positioned such that ultrasonic wave energy and microwave energy with controlled radiation patterns and intensities can be transmitted through an output aperture of the assembly.

4,556,071
METHOD AND APPARATUS FOR FORMING ROD-SHAPED ARTICLES OF THE TOBACCO PROCESSING INDUSTRY

Gottfried Hoffmann, Schwarzenbek, Fed. Rep. of Germany, assignor to Hauni-Werke Körber & Co. KG, Hamburg, Fed. Rep. of Germany

Filed Jan. 30, 1984, Ser. No. 575,168
Claims priority, application Fed. Rep. of Germany, Feb. 4, 1983, 3303777; Dec. 16, 1983, 3345609
Int. Cl.[4] A24C *5/14*
U.S. Cl. 131—84.4 24 Claims

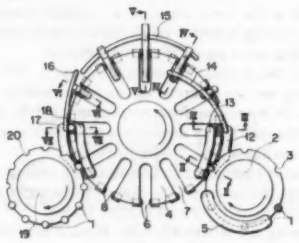


1. A method of forming a filler of fibrous material, such as tobacco, on a driven air-permeable conveyor which defines an elongated path, comprising the steps of continuously feeding fibrous material with a surplus over the quantity which is required in the filler at a variable rate into a first portion of the path and attracting the fibrous material to the conveyor by suction so that the resulting stream is densified and advances along said path; removing the surplus from the stream in a second portion of the path downstream of the first portion with attendant conversion of the stream into a filler, including removing fibrous material at a location which is disposed at a variable distance from the conveyor; monitoring the density of the filler and changing the distance between said location and the conveyor when the monitored density deviates from a predetermined value; monitoring the distance between said location and the conveyor; and varying the rate of feed of fibrous material into the first portion of the path as a function of changes in said distance.

4,556,072
CIGARETTE REVERSING APPARATUS

Motonobu Horie; Minoru Suzuki, and Shinji Ogura, all of Tokyo, Japan, assignors to The Japan Tobacco & Salt Public Corporation, Tokyo, Japan

Filed Nov. 9, 1983, Ser. No. 550,095
Claims priority, application Japan, Nov. 10, 1982, 57-196035
Int. Cl.[4] A24C *5/33*
U.S. Cl. 131—282 7 Claims



1. A cigarette reversing apparatus comprising

a rotating drum generally defined by a periphery and first

and second axial ends, said rotating drum having an axial thickness smaller than a cigarette length, said rotating drum having a plurality of slots extending in radial and axial directions and continuously open at the periphery and the first and second axial ends, each slot having cigarette holding means provided at an axially central portion adjacent to the periphery for holding a cigarette at a longitudinal center thereof, each slot defining a sufficient space to allow rotation of the cigarette about said longitudinal center;

cigarette feeding means for supplying a cigarette to each cigarette holding means such that the cigarette is held by the cigarette holding means at said longitudinal center in axial orientation;

cigarette end guide means for reversing said cigarette held in axial orientation by guiding two free end portions thereof for 180-degree rotation; and

retrieving means for taking out the reversed cigarettes from said slots one by one.

4,556,073

PROCESS FOR REDUCTION OF NITRATE CONTENT OF TOBACCO BY MICROBIAL TREATMENT

Lawrence E. Gravely, Louisville, Ky.; Vernon L. Geiss, Georgetown, Ind., and Charles F. Gregory, Middletown, Ky., assignors to Brown & Williamson Tobacco Corporation, Louisville, Ky.

Filed Jun. 15, 1978, Ser. No. 916,323
Int. Cl.[4] A24B *3/14, 15/02*
U.S. Cl. 131—297 **22 Claims**

1. A process of reducing the nitrate content of tobacco comprising:

(a) contacting a tobacco material with a built up inoculum containing a microorganism which degrades the nitrate content of said tobacco; and

(b) maintaining said tobacco in contact with said microorganism for an effective period of time at an effective temperature to reduce substantially the nitrate content of said tobacco material.

13. A process for reducing the nitrate content of tobacco comprising the steps of:

(a) mixing tobacco into an aqueous solution;

(b) removing the tobacco from the aqueous solution whereby a tobacco extract broth is left;

(c) adding *Micrococcus denitrificans* to the broth;

(d) incubating the *Micrococcus denitrificans;*

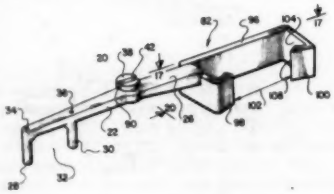
(e) adding the incubated *Micrococcus denitrificans* in said broth to said tobacco.

4,556,074

DENTAL FLOSSING TOOL

Marius J. Morin, Westlake Village, and Jack C. Munro, Thousand Oaks, both of Calif., assignors to Associated Medical Systems, Inc., Agoura Hills, Calif.

Continuation-in-part of Ser. No. 413,682, Sep. 1, 1982, abandoned. This application Oct. 27, 1983, Ser. No. 545,890
Int. Cl.[4] A61C *15/00*
U.S. Cl. 132—92 R **5 Claims**



1. In combination with a dental floss container, said container containing a quantity of dental floss which is to be dispensed therefrom as a single strand, a dental flossing tool comprising:

an elongated member having an aft end and a fore end, said elongated member having a longitudinal center axis;

container support means attached to said aft end, said container support means comprising a generally U-shaped side wall defining a substantially enclosed area for mounting in a fixed position said dental floss container, said container support means including adjustment means for tight connection of said dental flossing tool to various sizes of said dental floss container, said adjustment means comprising an opening formed within said U-shaped side wall creating a free end of said side wall on each side of said opening, each said free end being deflectable outwardly during insertion of said dental flosser container into said enclosed area to increase the size of said enclosed area to accommodate to the specific size of said dental floss container, upon insertion of said dental floss container within said enclosed area said free ends being biased into tight contact with said dental floss container tightly gripping said dental floss container;

first means located at said fore end forming a gap, said first means comprising a pair of spaced-apart members, said pair of spaced-apart members extending from said elongated member, said strand to be tightly stretched across said gap, the portion of said strand located prior to said first means being defined as said inner end and the portion of said strand extending from said first means being defined as said outer end; and

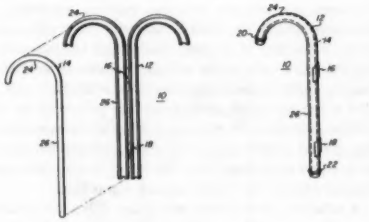
second means mounted on said elongated member for securing together said inner end and said outer end, said second means comprising a single member protruding from said elongated member, said inner end of said strand to be in contact with said single protruding member, said outer end to be wound around said single protruding member overlappingly engaging said inner end of said strand tightly securing said strand to said single protruding member and maintaining said strand in said tightly stretched condition across said gap.

4,556,075

TWO-IN-ONE QUICK RELEASE CANE

William P. Hoffman, 12550 Biscayne Blvd., North Miami, Fla. 33181

Filed Apr. 26, 1984, Ser. No. 604,172
Int. Cl.[4] A45B *3/00*
U.S. Cl. 135—65 **1 Claim**



1. A two-in-one cane used to assist a person's mobility comprising:

outer cane means and inner cane means, each of said cane means having a handle and a support member integrally to one another, said support members being substantially the same length and sized so that said inner support member is encased by said outer support member, said handles of both canes being shaped to integrally form a common handle when said inner support member is encased, and

means included as a part of said outer cane to permit said inner cane to be removed from said outer cane, whereby

two separate and independent canes are selectively useable to assist said person's mobility;

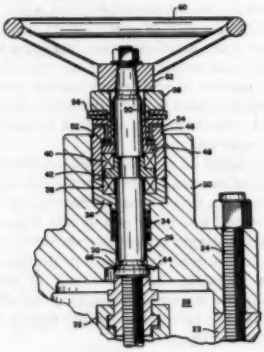
wherein said outer cane includes two halves hingedly connected.

4,556,076

FIRE RESISTANT VALVE

Charles D. Bridges, Houston, Tex., assignor to Gray Tool Comany, Houston, Tex.

Filed Apr. 18, 1983, Ser. No. 486,146
Int. Cl.⁴ F16K *17/38, 41/14*
U.S. Cl. 137—72 **4 Claims**



1. In a normally non-rising stem valve having a valve stem which passes out of a chamber in a valve housing through a bonnet having a passageway in which a packing normally seals between the valve stem and the valve bonnet and in which a bearing assembly journals the valve stem relative to the bonnet and a retainer normally secures the bearing assembly relative to the bonnet against substantial rising axial motion of the valve stem by physically interposing a r. ıg of fusible material between the retainer and the bearing assembly, a channel through which the fusible material may pass after melting when subjected to an abnormally high temperature for allowing the valve stem to rise a limited extent, an annular first metal sealing surface circumferentially provided on said valve stem and a second metal sealing surface provided on said bonnet within said chamber, the two sealing surfaces normally remaining spaced axially apart but which become annularly engaged in a sealed condition upon the rising of the valve stem by said limited extent; the improvement comprising:

a tubular spacer surrounding the valve stem having a radially outward projecting flange, said flange physically axially interposed between the fusible ring and the bearing assembly, said spacer further having a tubular section extending axially outward from said flange to a point external to the retainer;

an annular spring disposed about the tubular spacer external to the retainer; and

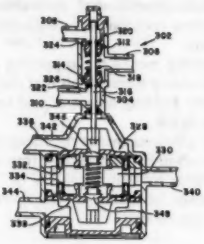
a compression nut, cooperating with the tubular spacer, for axially compressing the annular spring against the retainer, said compression nut exerting an outward axial force upon the tubular spacer for compressing the fusible ring between the spacer flange and the retainer.

4,556,077

SWITCHING VALVE FOR A FUEL SUPPLY SYSTEM

Richard H. Peyton, Berkley, Mass., assignor to Allied Corporation, Morristown, N.J.

Filed Dec. 20, 1983, Ser. No. 563,423
Int. Cl.⁴ F16K *11/02*
U.S. Cl. 137—112 **9 Claims**



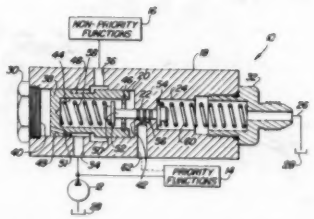
1. Valve mechanism for a fluid system having a pair of tanks, a primary circuit having a pair of branches communicated with a corresponding one of said tanks and a return system having a pair of branches for returning fluid to said tanks, said valve mechanism being responsive to communication of fluid through the branches of the primary circuit to communicate fluid in the return circuit to the tank from which fluid is being taken by the primary circuit, said valve mechanism including a housing having a pair of inlets communicated respectively with the branches of the primary system, an outlet communicated to the primary circuit, an inlet communicated to the return circuit, a pair of outlets communicated respectively with the branches of the return circuit, valve means for controlling communication between said inlet communicated to the return circuit and said pair of outlets communicated to the branches of the return circuit, and valve operating means for controlling said valve means, said valve operating means including a pressure differential responsive means responsive to the pressure differential between the inlets communicated with the branches of the primary circuit to shift the valve means from a first position communicating the inlet communicated with the return circuit with one of said outlets communicated with the return circuit, said valve operating means shifting said valve means to a second position communicating said last-mentioned inlet with the other of said outlets communicated to said return circuit.

4,556,078

PRIORITY VALVE

Richard A. Wittren, Cedar Falls, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Jun. 15, 1984, Ser. No. 621,359
Int. Cl.⁴ G05D *11/00*
U.S. Cl. 137—118 **11 Claims**



1. A priority valve for controlling fluid flow between a

power source and a hydraulic function operated by said power source, said valve comprising:

(a) a housing having first and second bores formed therein;

(b) an inlet passage connecting said power source to said first bore and an outlet passage connecting said first bore to said hydraulic function;

(c) a priority function which receives fluid from said power source positioned upstream of said inlet passage;

(d) a valve spool positioned in said first bore so as to divide said first bore into first and second ends, said valve spool having an annular groove which is in constant communication with both said inlet passage and with said first end of said first bore, said valve spool being movable between a first position which seals said outlet passage from communication with said annular groove and a second position wherein said annular groove is in communication with said outlet passage;

(e) a pin movably positioned in said second bore and having an enlarged end which extends into said first bore;

(f) biasing means for urging said valve spool toward said first position and said pin toward said valve spool;

(g) means for engaging said pin with said spool valve after limited free movement of said pin out of said first bore; and

(h) a load signal passage establishing fluid communication between said priority function and said second end of said first bore which fluid acts to urge said valve spool toward said first position and said pin out of said bore such that a decrease in pressue difference between said load signal passage and said inlet passage urges said valve spool toward said first position, an increase in pressure difference between said load signal passage and said inlet passage allows said valve spool to move toward said second position, and a predetermined maximum fluid pressure within said load signal passage causes said pin to move out of said first bore engaging and moving said spool toward said second position.

4,556,079

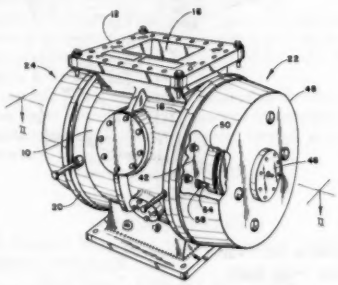
ROTARY VANE VALVE INCLUDING MEANS FOR ENSURING UNIFORM DISTRIBUTION OF PURGE GAS

John W. Pfeiffer, Hughesville, Pa., assignor to Koppers Company, Inc., Pittsburgh, Pa.

Filed Oct. 28, 1983, Ser. No. 546,373

Int. Cl.⁴ B08B *5/00;* **F16K** *51/00*

U.S. Cl. 137—240 **12 Claims**



1. In a rotary vane valve comprising a generally cylindrical housing section with opposed side material inlet and outlet openings allowing transverse material flow through said cylindrical housing section from a low pressure fluid containing means connected to the inlet opening and containing a relatively low pressure fluid to a high pressure fluid containing means connected to the outlet opening and containing a relatively high pressure fluid; a pair of end bell sections enclosing the opposed terminal ends of the cylindrical housing section; a central longitudinal axial shaft positioned within the cylindrical housing section and extending outwardly therefrom to be mounted in bearings contained in said end bell sections so as to be rotatable about its longitudinal axis; a pair of spaced, transversely oriented annular shroud members fixed at their inner edges to the shaft and extending radially outwardly therefrom so as to be spaced at their outer peripheral edges from the cylindrical housing section; a plurality of longitudinally oriented vanes radially projecting from the shaft and being spaced from the cylindrical housing at their terminal ends; at least one annular throttle plate having inner and outer peripheral edges and inner and outer lateral surfaces and said inner lateral surface having a low pressure zone adjacent the inlet opening and a high pressure zone adjacent the outlet opening ad being spaced axially outwardly from one of the shrouds and positioned at its outer peripheral edge adjacent to the cylindrical housing section; means for adjusting the distance between the annular throttle plate and its adjacent shroud; and means for introducing a purge gas at the inner edge of the annular throttle plate between said annular throttle plate and the shroud, such that said purge gas flows first radially outwardly between the inner lateral surface of said annular throttle plate and said shroud and then axially inwardly between the outer peripheral edge of said shroud and the cylindrical housing section to prevent particulate matter from migrating from inside the cylindrical housing section across the outer peripheral edges of the shroud members and into the end bell sections, wherein the improvement comprises a fluid flow resistance means on the low pressure zone of the inner lateral surface of the annular throttle plate for increasing frictional relative resistance to the outward radial flow of purge gas between the shroud and the low pressure zone of the inner lateral surface of the throttle plate as compared to the frictional resistance of the outward radial flow of purge gas between the shroud and the high pressure zone of the inner lateral surface of the annular throttle plate.

4,556,080

CASING WITH ASSISTED OPENING FOR PROTECTING AN APPARATUS IN THE FORM OF A POST

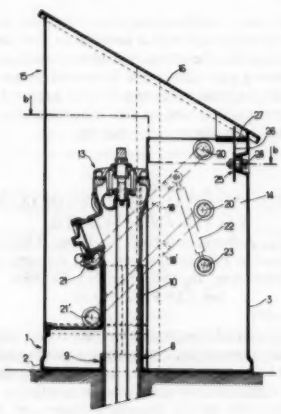
Michel M. R. Picaud, Saint Dizier, France, assignor to Societe Anonyme dite: Societe Metallurgique Haut-Marnaise, Joinville, France

Filed Jun. 29, 1984, Ser. No. 626,213

Claims priority, application France, Jun. 29, 1983, 83 10780

Int. Cl.⁴ E03B *9/06*

U.S. Cl. 137—296 **11 Claims**



1. An opening casing for protecting an apparatus in the form of a post (**10**) whose head comprises parts to be protected, characterized in that the casing comprises:

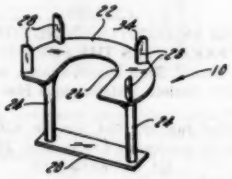
a fixed part (1) fixedly mounted to the post (10) below the zone to be protected, this fixed part comprising, on one side of the post (10), a support structure (14);
a mobile cover-forming part (15), for covering in the closed position the upper part of the post (10) while ensuring preferably a continuity of shape and/or of sealing with the fixed part (10);
a mechanical connection between the support structure (14) and the mobile part (15), including
a first pair of vertically aligned upper and lower pins (20,20') connected to the fixed part and spaced apart a pre-set distance,
a second pair of vertically aligned upper and lower pins (21,21') connected to the cover-forming part and spaced apart said pre-set distance,
an upper connecting link (18) connected to the upper pins (21,21) of the first and second pairs of pins, and
a lower connecting link (18) connected to the lower pins of the first and second pairs of pins; and
an assistance device mounted between the fixed part and the mobile part to help move the mobile part upward;
whereby the upper and lower links (18,18') connect the cover-forming part to the fixed part for upward and downward movement between open and closed positions and wherein the casing does not extend over more ground area than when the mobile part is in the open position than when the mobile part is in the closed position.

4,556,081

BUTTERFLY VALVE ADAPTOR

Michael S. Gagas, 5558 N. Shoreland Ave., Milwaukee, Wis. 53217

Filed Nov. 25, 1983, Ser. No. 555,192
Int. Cl.⁴ F16L *5/00*
U.S. Cl. 137—366 **6 Claims**



1. An adaptor for supporting a key box on the actuator housing of a butterfly valve in a position to provide access to the valve actuator for the valve, said adaptor comprising a base plate, a mounting plate having a U-shaped recess, a pair of posts for supporting said mounting plate in a spaced relation to a base plate and guide means on said mounting plate for aligning the key box with the valve actuator.

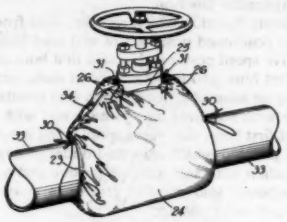
4,556,082

REMOVABLE THERMAL INSULATION JACKET FOR VALVES AND FITTINGS

James E. Riley, Auburn, and Neil W. Tyson, Opelika, both of Ala., assignors to Energy Systems, Inc., Auburn, Ala.

Filed Aug. 16, 1983, Ser. No. 523,650
Int. Cl.⁴ F16L *59/16*
U.S. Cl. 137—375 **16 Claims**

1. A thermally insulating jacket for valves and other fittings, which is readily removable, comprising a substantially flexible unitary jacket body portion, having a substantially flat configuration before application to a valve or other fitting and being readily conformable to the diverse contours of a valve or fitting when wrapped around the same, said jacket body portion having at least a pair of opposite sides and at least a pair of opposite side draw cords operable to draw the jacket into snug surrounding engagement with a valve or fitting, said jacket body portion having at least three layers with upper and lower cover layers and an insulative layer disposed between said upper and lower layers and having a continuous outer margin formed by said cover layers with said insulative layer being



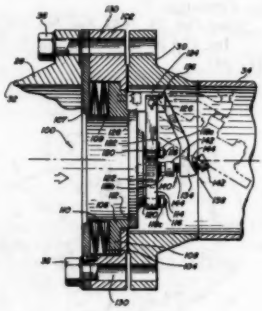
recessed from said margin, and being provided along said margin with channels for receiving said pair of draw cords, said cords having end portions emerging from the opposite ends of the channels.

4,556,083

PRESSURE RELIEF VALVE AND METHOD FOR MODIFICATION THEREOF

Daniel P. Schleiter, Sr., Mt. Prospect, Ill., assignor to Vapor Corporation, Chicago, Ill.

Filed Jan. 12, 1984, Ser. No. 569,792
Int. Cl.⁴ F16K *15/03, 21/04*
U.S. Cl. 137—514 **3 Claims**



1. A pressure relief valve, comprising:
an annular valve body,
an annular valve seat slidingly and concentrically mounted in said valve body,
at least on resilient shock absorbing member positioned between said valve body and said valve seat,
a valve arm pivotally mounted on said valve seat,
a valve disc mounted on said arm at a position to engage said valve seat in a valve closed position,
a lever pivotally mounted on said valve body adjacent said valve arm, and
a shock absorber on each of first and second sides of said lever wherein said first side is adjacent said arm.

4,556,084

AIR ADMITTANCE VALVE

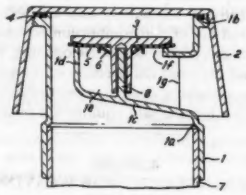
Adrian J. Frawley, "Timbercroft", Whitepost La., Culverstone, Near Meopham, Kent, England

Continuation of Ser. No. 518,559, Jul. 29, 1983, abandoned. This application Feb. 5, 1985, Ser. No. 698,260

Claims priority, application United Kingdom, Jul. 29, 1982, 8221946

Int. Cl.⁴ F16K *15/02*

U.S. Cl. 137—526 **4 Claims**



1. A valve, for admittance of atmospheric air into an upper end of a pipe when external air pressure exceeds pressure within the pipe, comprising:

(i) a tubular body having a side wall defining an upper end opening and a lower end opening,

(ii) an internal wall positioned in said body intermediate its upper and lower end openings, said internal wall including a first portion which extends from the side wall of the body partly across the interior of the body and a second integral wrapper portion which is coextensive with the first portion and together therewith defines within the body an internal chamber which has only a first opening directed towards the upper end opening of the body and a second and lateral opening provided in the side wall of the body,

(iii) a valve member including a valve element to seat removably on said wrapper portion to open and close said first opening of the internal chamber such that when said valve is in its closing position said first and second internal wall portions and said valve element collectively close off said internal chamber from the remainder of the interior of the body,

(iv) a guide element on said first internal wall portion extending centrally towards the first opening of the internal chamber,

(v) a hollow depending stem on said valve element to engage over and slide on said guide element for guiding said valve element during lifting and lowering of the valve member relative to said wrapper portion, and

(vi) a cap and cover removably engaged in airtight manner on an upper portion of said body and including a portion bounding said upper end opening thereof and spaced above said valve element.

4,556,085

SOLENOID VALVE

Frank G. Warrick, Muskegon, Mich., assignor to Sealed Power Corporation, Muskegon, Mich.

Filed Feb. 7, 1984, Ser. No. 577,852

Int. Cl.⁴ F15B *13/044*

U.S. Cl. 137—625.65 **10 Claims**

1. A normally open three way solenoid valve comprising

a housing including a first transverse wall of magnetic material,

a first axial extension extending from said transverse wall in one direction,

a peripheral wall of magnetic material extending axially in the opposite direction from the periphery of said transverse wall,

a second transverse wall of magnetic material extending radially outwardly into engagement with the peripheral wall of said housing,

a center pole of magnetic material extending axially from said second transverse all within said peripheral wall of said housing,

said center pole including a second axial extension of magnetic material extending in the opposite direction from said axial extension of said housing,

said transverse walls, peripheral wall and center pole defining a space,

a coil positioned in said space surrounding said pole,

said second axial extension and first transverse wall including an axial opening,

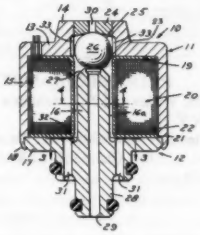
the end of the center pole within said housing defining a first seat,

a non-magnetic insert in said first axial extension of said housing defining a second seat and having an opening,

said first transverse wall and said first axial extension defining a cavity,

a ball of magnetic material interposed between said first and second seats and having limited axial movement between said seats,

the major portion of said ball extending into said cavity adjacent said second seat in said first axial extension,



said coil having portions spaced from the periphery of said center pole and defining a passageway,

a circumferential groove at the area of juncture of said center pole and transverse wall of said center pole, said groove facing axially toward said passageway and communicating with said passageway,

and a plurality of circumferentially spaced axial passages spaced radially outwardly from said passageway a distance such that the passages do not intersect said passageway, said passages intersecting said groove thereby providing communication with said passage, said passages extending from said groove to the exterior of said second axial extension such that when fluid is applied through the axial opening of said center pole and the coil is de-energized, fluid forces the ball against the second seat of said first axial extension and fluid flows through the axial opening of said second axial extension past said first seat about the pole to the annular groove and thereafter outwardly through the passages, and when the coil is energized, the ball is drawn toward the pole to seal against the first seat and permit flow through the axial opening of said first axial extension about the ball and the periphery of the pole and through the passages.

4,556,086

DUAL DISC LOW PRESSURE BACK-CHECK VALVE

Kenneth C. Raines, Bethlehem, Pa., assignor to Burron Medical Inc., Bethlehem, Pa.

Filed Sep. 26, 1984, Ser. No. 654,483

Int. Cl.⁴ F16K *15/14*

U.S. Cl. 137—852 **13 Claims**

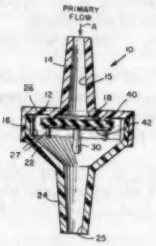
1. A one-way check valve which comprises:

a valve housing having a valve seat,

valve element means within said valve housing for opening

with a pressure differential of less than two inches of water and which is biased against the valve seat in a normally closed position,

a pair of support pins for holding said valve element means in said biased normally closed position, said valve element



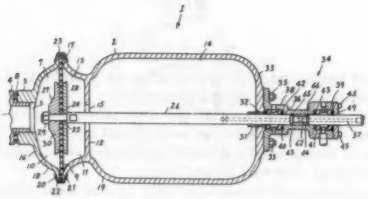
means including a flexible disc and a semi-rigid disc, said semi-rigid disc being of slightly smaller diameter than said flexible disc to reduce the chance of air bubbles clinging to the edge of the discs, said pair of support pins being within said valve housing, and these two pins being spaced 180° from each other.

4,556,087

PULSATION DAMPER

Joseph C. Casilli, Waldwick, N.J., assignor to ITT Corporation, New York, N.Y.

Filed Dec. 20, 1984, Ser. No. 684,226
Int. Cl.[4] F16L *55/04*
U.S. Cl. 138—30 **10 Claims**



1. A pulsation damper for damping pulsations in a fluid, comprising

a housing centered on an axis, having two axially spaced ends and an inner surface which bounds an internal chamber and two substantially coaxial openings at the respective axially spaced ends of said housing;

a movable wall extending across said internal chamber and sealingly subdividing the same into a fluid-containing compartment which has the fluid admitted thereinto through one of said openings during the use of the pulsation damper, and a gas-containing compartment that is in communication with the other of said openings, said wall being movable in either one of the axial directions out of a predetermined equilibrium position in response to pressure differential between said compartments;

means for admitting a pressurized gaseous medium into a first region of said other opening which is remote from said gas-containing compartment;

discharging means for communicating a second region of said other opening that is closer to said gas-containing compartment than said first region with the ambient atmosphere; and

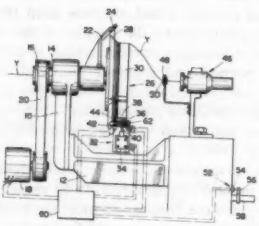
an actuating rod connected to said movable wall for joint movement therewith and having an extension portion which passes from said gas-containing compartment into said other opening and has an outer surface which forms respective interfaces with said inner surface in said other opening outside said regions, said actuating rod having internal conduit means which constantly communicates with said gas-containing compartment and opens onto a zone of said outer surface that is situated between and out of communication with either one of said admitting and discharging means in said equilibrium position of said movable wall and becomes at least partially aligned respectively with said admitting means and with said discharging means when excessive pressure in said fluid-containing compartment and in said gas-containing compartment respectively has moved said movable wall and said actuating rod out of said equilibrium position respectively toward and away from said other opening, respectively to increase and decrease the pressure of the gaseous medium in said gas-containing compartment to cause said movable wall to move toward said equilibrium position.

4,556,088

CONTROL ARRANGEMENT FOR WEAVING LOOM OR THE LIKE

Shigenori Tanaka, Hachioji, and Kouji Tomia, Tama, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Dec. 23, 1983, Ser. No. 564,691
Claims priority, application Japan, Dec. 27, 1982, 57-226592
Int. Cl.[4] D03D *47/36, 51/34*
U.S. Cl. 139—452 **8 Claims**



1. In a device

a source of thread;

a storage member onto which a plurality of loops of thread are wound for temporary storage prior use;

an apparatus which draws off thread from said temporary storage member when energized;

a first sensor for sensing the energization of said apparatus and outputting a signal indicative thereof;

a retaining device for selectively permitting thread to be drawn off said temporary storage member;

a second sensor for sensing the removal of each loop of thread removed from said storage member and outputting a signal indicative thereof;

a circuit operatively connected with said first sensor, said second sensor and said retaining device, said circuit including means responsive to the signals outputted by said first and second sensors for computing the time for which said retaining device should be operated to permit loops of thread to be removed from said storage member.

4,556,089

WEFT-THREAD MIXER DEVICE FOR WEAVING MACHINES

Yves Juillard, Mulhouse, France, assignor to Societe Alsacienne de Construction de Material Textile, France

Filed Jun. 4, 1984, Ser. No. 617,168
Claims priority, application France, Jun. 24, 1983, 83 10478
Int. Cl.[4] D03D *47/38*
U.S. Cl. 139—453 **6 Claims**

1. A weft thread mixer device for weaving machines com-

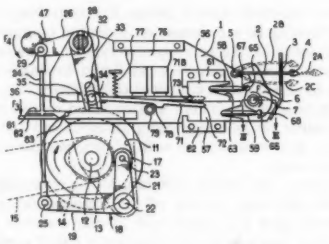
prising a support to be fastened to the machines and on which are mounted:

(A) a plurality of feed fingers intended for the various weft threads and each designed to assume selectively either an advanced active position for feeding a corresponding weft thread or a retracted inactive position;

(B) a plurality of rockers pivotally mounted on said support and respectively operatively connected to said feed fingers to move said fingers selectively either into said advanced active position or into said retracted inactive position;

(C) first individual control means for positively controlling the transfer of each said feed finger into said advanced active position, comprising a plurality of first slides for selectively putting corresponding feed fingers into said active position;

(D) second individual control means for positively controlling the return of each said feed finger towards said retracted inactive position, comprising a plurality of second slides for selectively putting corresponding feed fingers into said inactive position;



(E) said first and second slides being mounted on said support for parallel adjacent reciprocating movement and being respectively operatively connected to said rockers;

(F) selective connection means comprising a plurality of thrust rods each having a proximal end and a distal end, said proximal end being mounted on said support for longitudinal reciprocating movement in a direction parallel with the direction of movement of said slides, while said distal end is adapted to be positioned selectively either in an active position or in an inactive position facing selectively the corresponding first slide or the corresponding second slide to push either of said corresponding slides;

(G) general control means operatively connecting said proximal ends of said thrust rods with the main shaft of said machine to reciprocate said thrust rods in synchronism with said main shaft; and

(H) programmed selection control means also mounted on said support for bringing said distal ends of said thrust rods selectively into either of their two positions.

4,556,090

VACUUM FLUIDIZED POWDER FEED APPARATUS

Vimal K. Pujari, Columbia, Md., assignor to Allied Corporation, Morristown, N.J.

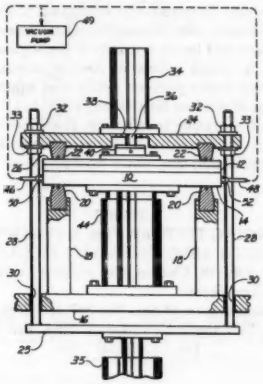
Filed Mar. 14, 1984, Ser. No. 589,905
Int. Cl.[4] B65B *1/04*
U.S. Cl. 141—59 **15 Claims**

14. A powder feed apparatus for filling the mold cavity of a powder mold having a fill aperture, means for vibrating the powder mold and means for evacuating the mold cavity, the powder feed apparatus comprising:

a feed cup having an enclosed bottom, a side wall circumscribing a cylindrical cavity adapted to receive a quantity of powdered material, an exit aperture provided through said enclosed bottom, at least one vent aperture provided through said sidewall proximate said enclosed bottom, and a flange extending radially from said sidewall;

a collar attached to said powder mold having an annular bearing surface slidably engaging said flange and supporting said feed cup with said enclosed bottom engaging the top surface of the powder mold and with said exit aperture concentric with said fill aperture;

a porous annulus disposed in the bottom of said cylindrical cavity and covering said at least one vent aperture, said porous annulus having an external diameter mating with



the inner surface of said cylindrical cavity and a conical inner surface sloping downwardly and terminating an aperture concentric with said exit aperture;

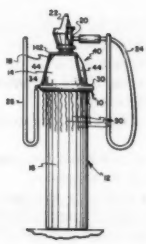
a pneumatic cylinder means disposed above said feed cup having a piston slidably received in said cylindrical cavity and producing a force urging the powdered material in said cylindrical cavity towards said exit aperture.

4,556,091

METHOD AND APPARATUS FOR COOLING SELECTED WALL PORTIONS OF A PRESSURIZED GAS CYLINDER DURING ITS FILLING

Bo Poulsen, Copenhagen, Denmark, assignor to AGA, A.B., Cleveland, Ohio

Filed Sep. 30, 1982, Ser. No. 428,905
Int. Cl.[4] B65B *1/20*
U.S. Cl. 141—82 **12 Claims**



1. An apparatus for differentially cooling wall portions of the outer wall of an elongated upstanding acetylene gas cylinder of the type having an upper end region that carries a cylinder filling connection and said cylinder therebeneath having an outer wall defining the acetylene gas chamber within the cylinder, comprising:

coolant dispensing means mounted in circumambient relation to said cylinder for dispensing coolant onto selected

lower portions of said outer wall for cooling said selected wall portions during filling of the cylinder with acetylene,

said selected lower wall portions of said cylinder being in spaced relation downwardly from said cylinder filling connection,

said cylinder including upper wall portions of substantial axial extent surrounding a portion of said acetylene gas chamber which are disposed between said cylinder filling connection and said selected lower portions of said outer wall, and

support means cooperatively associated with said cylinder for positioning said coolant dispensing means in proximity to said selected lower portions of said cylinder outer wall thereby to direct a flow of coolant across said selected outer wall lower portions while said upper portions remain free of coolant flow thereover, whereby the concentration of acetylene is relatively lower within said upper wall portions of said cylinder as compared with its concentration within said lower wall portions.

4,556,092

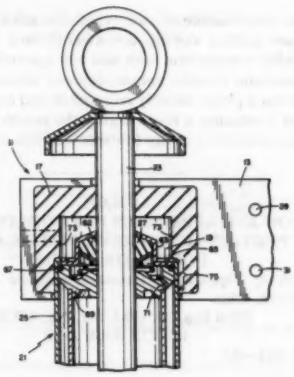
GAS CHARGING FIXTURE FOR HYDROPNEUMATIC SHOCK ABSORBERS AND THE LIKE

Joseph Cubalchini, St. Charles, Ill., assignor to Maremont Corporation, Carol Stream, Ill.

Continuation-in-part of Ser. No. 567,266, Dec. 30, 1983, abandoned. This application Mar. 9, 1984, Ser. No. 587,889

Int. Cl.[4] B65B *3/04*

U.S. Cl. 141—98 **4 Claims**



1. A charging fixture for gas charging a damper, the damper having an intermediate cylinder head, an outer cylinder with an outer cylinder surface and a piston rod seal displaceable by pressurized gas entering along the intermediate cylinder head, the charging fixture comprising:

a pair of body members adapted to be forced together under pressure;

guide means for aligning said body members when said body members are forced together;

means defining a cavity in said body members, the cavity being of a size of receiving the damper, the cavity communicating with the piston rod seal of the damper for deforming the seal when pressurized gas is within the cavity;

said cavity-defining-means including a compressible material disposed in the cavity for compressibly receiving the outer cylinder surface of the damper in the proximate area of the inner head seal, the compressible material being sized for compressing the outer cylinder surface of the damper when the body members are forced together, for deforming portions of the outer cylinder contiguous to the intermediate cylinder head seal for enhancing the sealing action of the intermediate cylinder head seal;

passageway means connecting said cavity externally of said members; and

means for connection of said passageway means to a high pressure source of gas.

4,556,093

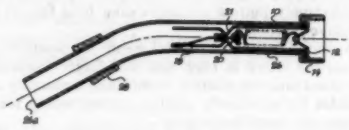
AUTOMATIC SHUTOFF DEVICE

William E. M. Jones, 11 Jackladder Cir., Horsham, Pa. 19044

Filed Feb. 21, 1984, Ser. No. 582,034

Int. Cl.[4] B65B *1/30*

U.S. Cl. 141—206 **8 Claims**



1. An automatic shutoff device for controlling the flow of liquid flowing in a downstream direction comprising an extended sleeve having an upstream end and a downstream end, said extended sleeve directing said liquid flowing in said downstream direction into a container to be filled;

a tubular member within said extended sleeve, said tubular member further comprising an input end and an output end, said input end of said tubular member being flared outwardly;

an adaptor, one end portion of which is internally threaded, the other end portion of said adaptor being inwardly flared such that when said tubular member is inserted within said adaptor the outwardly flared portion of said tubular member cooperatively rests on the inwardly projecting end portion of said adaptor;

a conically shaped perforated baffle positioned within said adaptor such that said conically shaped perforated baffle projects into said tubular member from the input end thereof;

the output end of said tubular member further comprising a downstream projecting constrictive nozzle having an orifice of substantially reduced cross section relative to the cross section of said input end of said tubular member, said output end of said tubular member further comprising a valve seat;

a ball operatively positioned within said tubular member and in proximity to said output end thereof to enable said ball to serve as a valve for substantially terminating the flow of fluid from the source of fluid supply;

a spring connected at one end to said ball and at the other end to said baffle, said spring normally biasing said valve to its open position;

a longitudinally extended housing one end of which is open and of substantially larger diameter than the diameter of said downstream projecting constrictive nozzle, the other end of said longitudinally extended housing comprising an opening of reduced cross section relative to the cross sectional diameter of said tubular member so as to enable said longitudinally extended housing to be mounted on said downstream projecting constrictive nozzle and slidably movable thereon;

an actuator comprising a relatively stiff rodlike member connected at one end to said ball and projecting through said downstream projecting constrictive nozzle, said actuator being attached at its other end to said longitudinally extended housing;

whereby, when selectively actuated, fluid flows from a fluid supply source into said automatic shutoff device via said adaptor past said baffle and into said tubular member via said input end, around said spring and ball, said fluid thereafter passes out said downstream projecting constrictive nozzle at substantial velocity and follows a conform-

ing path defined by said extended sleeve into the container to be filled, such flow continues until such time as the fluid level within the container rises to a level which completely immerses the downstream end of said extended sleeve whereby a negative pressure area is formed at the orifice of the downstream projecting constrictive nozzle in consequence of which liquid flows into said extended sleeve and immerses the end of said longitudinally extended housing causing said housing to move in the downstream direction causing said ball to seat on said valve seat thereby substantially terminating the flow of fluid through said device.

4,556,094

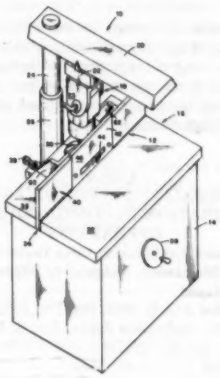
FENCE FOR A RADIAL ARM SAW USED AS A DADO CUTTER OR MOLDING CUTTER

Calvin B. Willocks, Rte. 4, Box 58, Maryville, Tenn. 37801

Filed Jul. 3, 1984, Ser. No. 627,450

Int. Cl.[4] B27C *1/12*

U.S. Cl. 144—253 J **9 Claims**



1. For use with a radial arm saw outfitted with a horizontal cutting head to operate as a dado cutter or molding cutter and having a saw table with an adjustable fence slot, a fence comprising:

work surface means secured in the fence slot for providing a work surface generally perpendicular to the saw table;

an adjustable gate having a face in alignment with and continuous with said work surface of said work surface means, said gate having an aperture for admitting the cutting head so that a work-performing portion of the cutting head extends outwardly from said face of said gate, said gate being movable between a first position where said aperture is adjacent to the saw table and at least part of said gate is below the surface of the saw table and a second position where said aperture is above the saw table; and

means for securing said gate in a selected position between and including said first position and said second position.

4,556,095

ARCUATE BLIND

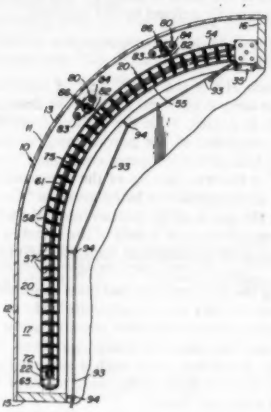
Harold M. Lewis, Montgomery, Pa., assignor to Marathon Manufacturing Company, Mongtomery, Pa.

Filed Jun. 29, 1984, Ser. No. 626,302

Int. Cl.[4] E06B *9/26*

U.S. Cl. 160—166 R **9 Claims**

1. A nonplanar blind comprising a pair of end rails for location in parallel spaced relation, mounting means mounting said end rails in said parallel spaced relation and adapted for fastening to a building construction, flexible ladders extending between said end rails, a plurality of slats extending through and supported by said ladders, an elongate stay means extending through said slats and having opposite ends extending respectively into and terminating in endwise bearing engagement with said rails, said stay means being arcuate in a plane transverse to said rails for maintaining said slats in a nonplanar relation defined by said stay means.



4,556,096

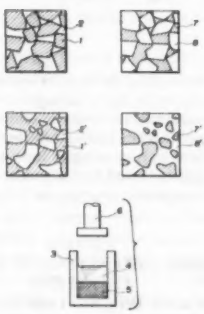
METHOD FOR THE PREPARATION OF A SPONGY METALLIC BODY

Sumio Nagata, Tosu; Kazuhide Kanaiwa, and Takashi Ichikawa, both of Nagoya, all of Japan, assignors to Director-General of the Agency of Industrial Science and Technology, Tokyo and Shachihata Kogyo K.K., Aichi, both of, Japan

Filed Jan. 14, 1985, Ser. No. 690,889

Int. Cl.[4] B22D *29/00, 25/00*

U.S. Cl. 164—79 **11 Claims**



1. A method for the preparation of a porous spongy body of a metal or alloy having an open cell structure which comprises the steps of:

(a) compacting a powder of an inorganic compound soluble in at least one solvent and having a particle size distribution in the range from 10 to 5000 μm into a form of powder compact;

(b) forming interconnections at least partly bridging the particles in the powder compact to form a porous integral mass of which the volume fraction of the inorganic compound is V^P:

(c) preheating the porous integral mass at a preheating temperature T^P which is lower than the melting point of the inorganic compound and between the solidification temperature of the metal or alloy T^M and a critical preheating temperature T^C defined by the equation

$$T^C = T^M - 0.25(H^M \cdot D^M / V^P \cdot C^P \cdot D^P),$$

in which H^M is the latent heat of solidification of the metal or alloy in calories/g, D^M is the density of the metal or alloy in g/cm^3, V^P is the volume fraction of the inorganic compound in the porous integral mass, C^P is the specific heat of the inorganic compound in calories/g.°C. and D^P is the true density of the inorganic compound in g/cm^3, all temperatures being given in °C.;

(d) filling the pores of the porous integral mass of the inorganic compound with a melt of the metal or alloy to form a porous mass impregnated with the melt of the metal or alloy;

(e) cooling the thus impregnated mass to solidify the melt of the metal or alloy into a composite body of the inorganic compound and the solidified metal or alloy; and

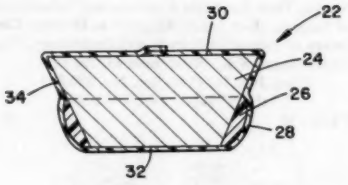
(f) removing the inorganic compound from the composite body by dissolving away with a solvent capable of dissolving the inorganic compound to leave the metal or alloy in a spongy form.

4,556,097

MOLD PLUG AND METHOD FOR SEALING AN INGOT MOLD

Kevin L. Burmeister, Kent, Ohio, assignor to Graphite Sales, Inc., Chagrin Falls, Ohio

Filed Jun. 27, 1984, Ser. No. 625,085
Int. Cl.[4] B22D *7/06, 7/12*
U.S. Cl. 164—137 **31 Claims**



11. A plug for sealing the bottom opening in a top pouring mold comprising, a plug body having top and bottom ends and an outer peripheral surface between said ends and received in said opening, a coating of heat curable sealing material on said peripheral surface and covering at least a portion of said surface between said ends, and heat degradable plastic film means on said body completely covering said coating.

4,556,098

HOT CHAMBER DIE CASTING OF ALUMINUM AND ITS ALLOYS

Hans E. Hintermann, Bern, and Dominique Hertz, Neuchâtel, both of Switzerland, assignors to Laboratoire Suisse de Recherches Horlogeres, Switzerland

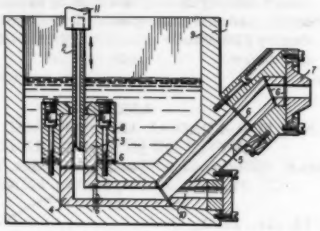
Continuation of Ser. No. 935,011, Aug. 18, 1978, abandoned.
This application Feb. 25, 1980, Ser. No. 124,257
Int. Cl.[4] B22D *17/04*
U.S. Cl. 164—316 **15 Claims**

1. A hot chamber die casting apparatus, to be used in the casting of articles of aluminum, aluminum alloys, zinc, magnesium, copper and their alloys and all other alloys which in the molten state corrode ferrous materials, comprising,

a crucible for molten metal;

an injection cylinder and piston assembly disposed in said crucible, said cylinder having an inlet end and a discharge end, the top of the head of said piston being so shaped as to be partly withdrawn from the inlet end of said cylinder during each piston cycle to periodically open said cylinder to said crucible;

a gooseneck having an inlet end and discharge end, the inlet end of said gooseneck being connected to the discharge end of said cylinder, and



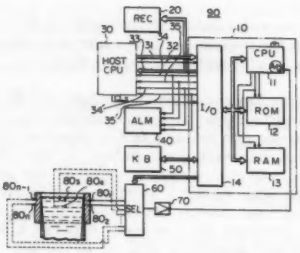
an outlet nozzle connected to the discharge end of said gooseneck and opening externally of said crucible to a die, the apparatus being characterized by the fact that said cylinder and said piston are made of at least one of the group consisting of hot-pressed, very hard silicon nitrides or sialones of high density.

4,556,099

ABNORMALITY DETECTION AND TYPE DISCRIMINATION IN CONTINUOUS CASTING OPERATIONS

Toshiki Yamamoto; Yukio Kiriu; Akira Tsuneoka, and Kunikane Sudo, all of Oita, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Jan. 6, 1982, Ser. No. 337,363
Claims priority, application Japan, Jan. 8, 1981, 56-1422
Int. Cl.[4] B22D *11/04, 11/16*
U.S. Cl. 164—451 **7 Claims**



1. A method for detecting an abnormality of a solidified shell of casting liquid metal within a mold for continuous casting, comprising the following steps:

(a) repeatedly measuring temperatures along a direction of flow of said solidified shell, at upper and lower portions of an inside wall of the mold which is directly in contact with the solidified shell, both said portions being lower than a surface level of the liquid metal within the mold;

(b) detecting a first condition which is an occurrence of a temperature inversion between a temperature T_U at said upper portion and a temperature T_L at said lower portion, said inversion defined as $T_U \leqq T_L$;

(c) detecting a second condition defined by the last measured temperature T_L being higher than the average value of the temperature T_L, with said average value being determined by one of an arithmetic mean, a harmonic mean and an

envelope of a variation curve of said temperature T_L as measured in a time series; and

(d) discriminating the type of abnormality to be an opening of the solidified shell when said first and second conditions are simultaneously detected.

7. An apparatus for detecting abnormalities in a solidified shell of a liquid metal during continuous casting comprising:

mold means for continuously casting said liquid metal in a direction parallel with the force of gravity;

upper and lower temperature detection means for outputting respectively T_U and T_L temperatures indicative of the temperature of respective upper and lower portions of said mold means;

abnormality indication means for outputting a signal indicative of an abnormality in said solidified shell whenever said T_U temperature is less than or equal to said T_L temperature; and

abnormality discrimination means, responsive to said abnormality signal, for periodically comparing respectively the most recent temperatures T_U and T_L with recent average temperatures thereof so as to discriminate the occurrence of a breakout abnormality whenever said most recent T_U or T_L temperature is significantly higher than its respective said recent average temperature and to discriminate the occurrence of an inclusion abnormality whenever said most recent T_U or T_L temperature is significantly lower than its respective said record average temperature, wherein

said breakout abnormality constitutes an opening in the surface of said solidified shell and said inclusion abnormality constitutes an included non-metal particle near the surface of said solidified shell.

4,556,100

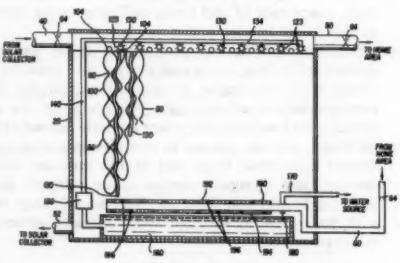
THERMAL ENERGY STORAGE UNIT

William C. Whitman, 3 Fourth St., New Brunswick, N.J. 08901

Continuation-in-part of Ser. No. 359,366, Mar. 18, 1982, abandoned. This application Jun. 4, 1984, Ser. No. 616,842

Int. Cl.⁴ F28D *17/00, 21/00*

U.S. Cl. 165—10 **16 Claims**



1. A thermal storage assembly comprising

a housing,

a plurality of containers of chemical salts of a type which can store thermal energy, said containers comprising plastic sheets secured together to form pockets in which said salts are packed, and

means in said housing for maintaining said containers spaced from each other, said means comprising lengths of material disposed between said containers and extending along the lengths of said containers.

4,556,101

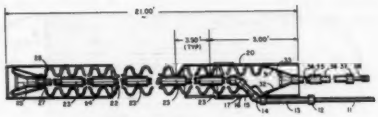
WAVY TUBE HEAT PUMPING

Charles W. Haldeman, Concord, Mass., assignor to Megatech Corporation, Billerica, Mass.

Continuation-in-part of Ser. No. 248,964, Mar. 30, 1981, abandoned, which is a continuation-in-part of Ser. No. 948,760, Oct. 5, 1978, abandoned. This application Apr. 18, 1983, Ser. No. 486,250

Int. Cl.⁴ F28D *15/00*

U.S. Cl. 165—45 **4 Claims**



1. Geothermal heat transfer apparatus comprising,

heat exchanging means for orientation in the earth below ground substantially vertically and having a hollow conduit of length from top to bottom much greater than the span across said hollow conduit orthogonal to its length having a top portion near said top, bottom portion near said bottom and an intermediate portion contiguous and communicating with said top and bottom portions for allowing thermally conductive fluid to flow freely between said top, intermediate and bottom portions for immersion in thermally conductive fluid in the region around said heat exchanging means for increasing the heat flow between the latter and earth when inserted into a substantially vertical borehole in the earth with said top portion above said bottom portion,

said heat exchanging means comprising heat exchanging conduit means in said intermediate portion for carrying refrigerant,

said heat exchanging conduit means comprising a plurality of tubes of thermally conductive material for carrying said refrigerant and extending along the length of said hollow conduit for a tube length that is less than said length of said hollow conduit,

said hollow conduit being formed with port means between said top and said plurality of tubes for allowing said thermally conductive fluid to pass in a flow path embracing said plurality of tubes, said bottom portion, an outer channel around said hollow conduit and said port means,

a thermally conducting tube embracing the axis of said hollow conduit inside said conduit in said intermediate portion for carrying refrigerant,

said tubes of thermally conductive material being wavy,

said tubes of thermally conductive material extending between said conducting tube and said conduit for substantially the entire radial distance therebetween having waves characterized by a wavelength that is greater than the diameter of said tubes and less than the diameter of said conduit and comprising means for creating eddies in fluid moving in an axial direction within said conduit to enhance the heat transfer between said fluid and said tubes and for creating eddies in said refigerant inside said tubes to enhance the heat transfer between said refrigerant and said tubes,

and means for intercoupling said conducting tube and said tubes of thermally conductive material to form a refrigerant flow path in a first direction through said thermally conducting tube embracing the axis of said hollow conduit and in a second direction opposite to said first direction through said tubes of thermally conductive material.

4,556,102

BATCH-TYPE SCRUBBING-BALL REPLACEMENT SYSTEM FOR HEAT EXCHANGER

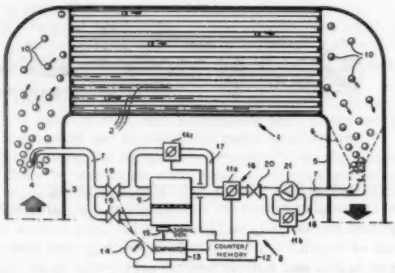
Rolf Bochinski, Duisburg; Klaus Eimer; Alois Lange, both of Ratingen, and Xuan L. Nghiem, Krefeld, all of Fed. Rep. of Germany, assignors to Taprogge Gesellschaft mbH, Dusseldorf, Fed. Rep. of Germany

Filed Mar. 16, 1984, Ser. No. 590,482

Claims priority, application Fed. Rep. of Germany, Mar. 17, 1983, 3309510; May 3, 1983, 3316022

Int. Cl.[4] F28G *1/12*

U.S. Cl. 165—95 **8 Claims**



1. A method of operating a tube-type heat exchanger having intake and output conduits and tubes connected therebetween, and a return conduit extending from the output to the intake conduit, the method comprising the steps of:

passing a coolant liquid from the intake to the output conduit through the tubes;

releasing balls into the intake conduit from the return conduit and passing the balls with the coolant through the tubes to clean same;

trapping balls in the output conduit and introducing them into the return conduit, whereby it takes a predetermined average time for a ball to make a circuit of the tubes and return conduit;

measuring the momentum of each of the balls in the return conduit and generating an output corresponding thereto;

comparing the outputs with a set-point signal corresponding to minimum acceptable ball momentum; and

withdrawing all of the balls from the conduits when in a predetermined period of time many times longer than this average time a predetermined number of the outputs fall below the set-point signal and replacing the withdrawn balls with fresh balls.

4,556,103

HEAT EXCHANGE APPARATUS WITH BLOWER AND HELICAL CONDUIT SYSTEM

Masatoshi Kuwa, Tokyo; Ryusuke Kamanaka, and Toshio Nihei, both of Yokohama, all of Japan, assignors to Nepon Co. Ltd., Tokyo, Japan

Filed Sep. 21, 1981, Ser. No. 304,073

Claims priority, application Japan, Sep. 25, 1980, 55-135374[U]; Oct. 29, 1980, 55-153534

Int. Cl.[4] F24H *3/08;* **F28F** *13/12;* **F24B** *1/06;* **F28D** *7/02*

U.S. Cl. 165—122 **5 Claims**

1. Heat exchange apparatus for exchanging that between water and air, comprising:

a first hollow, upright, elongate cylindrical body having a top end, a closed bottom end and an outer wall of the heat exchange apparatus therebetween;

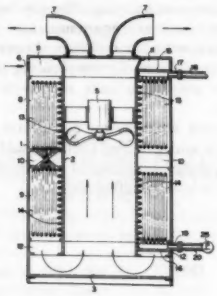
a second hollow elongate cylindrical body, having a diameter smaller than said first body, disposed concentrically within said first body and forming an elongate annular space between said first and second cylindrical bodies, a bottom end of said second body being open and spaced from said first body closed bottom end to form a space therebetween for passage of air between said second cylindrical body and said annular space;

air intake means, adjacent said top end of said first body, for intake of air into said heat exchange apparatus;

a plurality of air exhaust tubes adjacent and extending upwardly above the top end of said first body, said exhaust tubes being bent over and directed radially outwards with respect to said first cylindrical body for discharging air horizontally from said heat exchange apparatus;

ring shaped upper and lower heat exchange compartments within said annular space defining central, upper, and lower annular chambers between, above, and below said compartments with said upper and lower chambers in communication with each other through said heat exchange compartments and said central chamber;

multiple winding concentric upper and lower coil tubes within said upper and lower heat exchange compartments respectively, with ends of said upper and lower coil tubes arranged so that outer coil tubes and inner coil tubes of said upper coil tubes are successively connected in said



central annular chamber to inner coil tubes and outer coil tubes, respectively, of said lower coil tubes;

an upper header in said upper annular chamber and having a water connection extending therefrom through said outer wall, upper ends of said upper coil tubes being connected to said upper body;

a lower header in said lower annular chamber and having a water connection extending therefrom through said outer wall, lower ends of said lower coil tubes being connected to said lower header; and

a blower secured within said second body, and spaced downwardly from a top end thereof, for drawing air in through said air intake means and discharging the air through said air exhaust tubes after said air has passed through both said annular space and said second cylindrical body, said air passing in one direction through said second cylindrical body and in the opposite direction through said elongate annular space wherein said air passes over said coil tubes to effect an exchange of heat with water flowing through said coil tubes between said water connections.

4,556,104

HEAT EXCHANGER

Rolf D. Engelhardt, Grachtweg 1, D-5137 Waldfeucht/Obspringen, Fed. Rep. of Germany, assignor to Rolf Dieter Engelhardt, Waldfeucht/Obspringen, Fed. Rep. of Germany

Filed Jul. 6, 1984, Ser. No. 628,080

Claims priority, application Fed. Rep. of Germany, Jul. 6, 1983, 8319454[U]

Int. Cl.[4] F28F *3/12*

U.S. Cl. 165—145 **7 Claims**

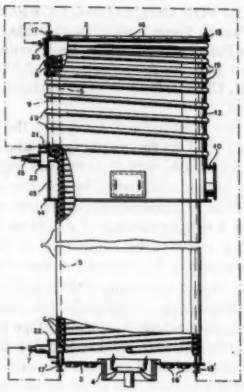
1. A heat exchanger comprising: a generally cylindrical

metallic housing with a peripheral wall centered on a vertical axis, a substantially flat bottom and a substantially flat top;

a source of combustion gases at said bottom, said housing being provided with an exit port for said combustion gases at a level substantially above said bottom;

tubing in said housing traversed by an organic liquid to be heated by said combustion gases; and

conduit means in contact with outer surfaces of said housing for the passage of a cooling fluid absorbing some of the heat generated in said housing, said conduit means comprising a multiplicity of channels open toward said outer surfaces, said channels passing in a multiplicity of helicoi-



dal turns around at least part of said peripheral wall, said cylinder wall being divided into a lower part of smaller diameter and an upper part of larger diameter, said tubing forming an inner coil with closely adjoining turns extending within said housing over nearly the full height thereof and an outer coil closely adjoining turns surrounding said inner coil within said upper part, said exit port being located near the junction of said lower and upper parts whereby combustion gases rising inside said inner coil are deflected at said top and descend along said outer coil to said exit port, said helicoidal turns being of varying pitch with minimum spacing in the vicinity of said top.

4,556,105

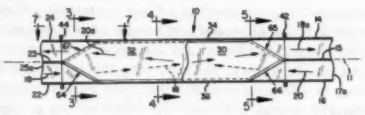
PARALLEL HEAT EXCHANGER WITH INTERLOCKING PLATE ARRANGEMENT

Alan H. Boner, 140 W. 16th Ave., Eugene, Oreg. 97401

Filed Oct. 24, 1983, Ser. No. 544,824

Int. Cl.⁴ F28D *7/02*

U.S. Cl. 165—165 **16 Claims**



1. An air-to-air parallel plate counterflow heat exchanger comprising:

a plurality of similar elongated plates of a predetermined width arranged in a parallel array and spaced apart to define at least one pair of adjoining enclosed elongated passageways including an incoming airway and an exhaust airway arranged for exchanging heat between counterflowing incoming and exhaust airflows, each plate having pointed opposite ends each terminating at an apex along a widthwise midline extending lengthwise of the passageways;

first means defining an air inlet conduit connected at one end of the array on one side of said midline for conveying air into one of the airways; and

second means defining an air discharge conduit connected at an opposite end of said plates on an opposite side of said midline for conveying air from said one airway;

the inlet and discharge conduits extending parallel to said midline so that air flows from the inlet conduit in a direction parallel to said midline into said one airway, through said one airway in isolation from the other airway, and out of the one airway in a direction parallel to said midline into the discharge conduit with a minimum change of momentum.

4,556,106

GASKETING FOR HEAT EXCHANGER PLATES

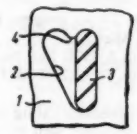
Geoffrey R. Evans, Crawley, England, assignor to APV International Limited, England

Filed Apr. 4, 1984, Ser. No. 596,516

Claims priority, application United Kingdom, Apr. 18, 1983, 8310399; Sep. 2, 1983, 8323539

Int. Cl.⁴ F28F *3/00*

U.S. Cl. 165—166 **12 Claims**



1. In a heat exchanger plate assembly comprising a plate having a gasket recess and a gasket held in the said recess by interengagement of a series of projections on the gasket and a series of apertures in the plate: the improvement that the projections are movable within the apertures between a first position, in which the projections may move freely in and out of the apertures, and a second position, in which the movement in and out of the apertures is strongly resisted by interference between the projection and the aperture.

4,556,107

STEAM INJECTION INCLUDING ALPHA-OLEFIN SULFONATE DIMER SURFACTANT ADDITIVES AND A PROCESS OF STIMULATING HYDROCARBON RECOVERY FROM A SUBTERRANEAN FORMATION

John H. Duerksen, Fullerton; Robert G. Wall, Pinole, and Jack D. Knight, Berkeley, all of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Apr. 28, 1983, Ser. No. 489,649

Int. Cl.⁴ E21B *43/24*

U.S. Cl. 166—272 **29 Claims**

1. A process for recovering hydrocarbons from a subterranean hydrocarbon bearing formation penetrated by at least one injection well and at least one production well, said process comprising:

forming a steam and alpha-olefin sulfonate dimer foam;

passing said steam and alpha-olefin sulfonate dimer foam into said formation and away from an injection well to assist the movement of hydrocarbons toward a production well; and

recovering hydrocarbons at said production well.

4,556,108

MICELLAR SLUG FOR OIL RECOVERY

Hiroshi Morita, Chiba; Yasuyuki Kawada, Funabashi; Junichi Yamada, and Toshiyuki Ukigai, both of Chiba, all of Japan, assignors to Lion Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 458,360, Jan. 17, 1983, Pat. No. 4,532,053. This application Mar. 31, 1983, Ser. No. 480,771
Claims priority, application Japan, Jan. 28, 1982, 57-10858; Mar. 19, 1983, 58-45291
The portion of the term of this patent subsequent to Jul. 30, 2002, has been disclaimed.
Int. Cl.⁴ E21B *43/22*
U.S. Cl. 166—274 **5 Claims**

5. A process for producing oil from an oil-bearing subterranean reservoir penetrated by wells which comprises the steps of:

(1) injecting into a subterranean reservoir having water with a salinity content within the range of 0.1% to 15%, through an injection well the micellar slug consisting essentially of a hydrocarbon, an aqueous medium, a surfactant, and a cosurfactant, said surfactant containing, as an essential component, an internal olefin sulfonate having 10 to 26 carbon atoms and a disulfonate content of about 20% by weight or less;

(2) injecting into said reservoir at least one driving fluid; and

(3) recovering oil from said reservoir through a production well.

4,556,109

PROCESS FOR CEMENTING GEOTHERMAL WELLS

Louis H. Eilers, Inola, Okla., assignor to The Dow Chemical Company, Midland, Mich.

Filed Jul. 2, 1979, Ser. No. 53,881
Int. Cl.⁴ E21B *33/14*
U.S. Cl. 166—295 **1 Claim**

1. In the process of cementing casing tubes into a wellbore of a geothermal or geopressure well by emplacing a curable slurry into the annulus between the casing tube and the wellbore and thereafter permitting the slurry to cure, the improvement comprising using a pumpable slurry comprising (a) crushed coal and (b) furfuryl alcohol, furfural, and/or a low molecular weight mono- or copolymer thereof.

4,556,110

CORROSION INHIBITION

Yulin Wu, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 30, 1984, Ser. No. 645,722
Int. Cl.⁴ C23F *11/16*
U.S. Cl. 166—310 **17 Claims**

1. A method for treating and inhibiting the corrosion of metal surfaces in a well used for the recovery of natural fluids from a subterranean formation which comprises injecting into a well a composition comprising

(a) the reaction mass resulting from reacting

(1) unsaturated hydrocarbyl nitrile having the formula

$$\begin{array}{l} R^{(1)} \\ | \\ C{=}CR^{(3)}{-}CN \\ | \\ R^{(2)} \end{array}$$

wherein $R^{(1)}$, $R^{(2)}$ and $R^{(3)}$ are hydrogen, aryl or alkaryl radicals with 6 to 10 carbon atoms or alkyl radicals with 1 to 5 carbon atoms, and wherein these radicals can be the same or different, and

(2) metal hydrocarbyl sulfonate having the formula

$$(R{-}CH_2{-}A{-}SO)_nM$$

wherein R is a hydrocarbyl radical having 3–30 carbon atoms, A is an aromatic, alkenylene or alkylene radical having 6 to 30 carbon atoms, n is the valence of M, and M is selected from the group consisting of ammonium, and alkali and alkaline earth metals to produce a cyanohydrocarbylated hydrocarbyl sulfonate product in the presence of a base and in the essential absence of water, and

(b) an alcohol containing 1 to about 15 carbon atoms and a volume ratio of (a) to (b) ranging from 10:1 to 1:10, and allowing the composition to contact the metal surfaces for a time sufficient to form corrosion-inhibiting film thereon.

4,556,111

METHOD FOR INHIBITING CORROSION

Yulin Wu, and Paul R. Stapp, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 30, 1984, Ser. No. 645,731
Int. Cl.⁴ C23F *11/12*; E21B *41/02*
U.S. Cl. 166—310 **11 Claims**

1. A method for treating and inhibiting the corrosion of metal surfaces in a well for the recovery of natural fluids from a subterranean formation, which comprises injecting into a well used a composition comprising the reaction adduct resulting from the reaction of a maleic anhydride and an oil containing at least about 5 weight percent of a polynuclear aromatic compound having a molecular weight of at least 155, and allowing the composition to contact the metal surfaces for a time sufficient to form a corrosion-inhibiting film thereon.

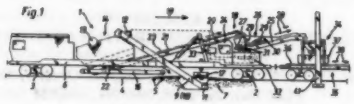
8. A method for treating a metal surface to inhibit corrosion thereof comprising contacting the metal surface with a composition comprising the reaction adduct resulting from the reaction of a maleic anhydride and an oil containing at least about 5 weight percent of a polynuclear aromatic compound having a molecular weight of at least about 155.

4,556,112

MOBILE CONVEYOR ARRANGEMENT

Josef Theurer, Vienna, and Manfred Brunninger, Linz, both of Austria, assignors to Franz Plasser Bahn-baumaschinen-Industriegesellschaft m.b.H., Vienna, Austria

Filed Dec. 7, 1983, Ser. No. 558,937
Claims priority, application Austria, Dec. 29, 1982, 4729/82
Int. Cl.⁴ E01B *27/10*; D02F *3/08*
U.S. Cl. 171—16 **5 Claims**



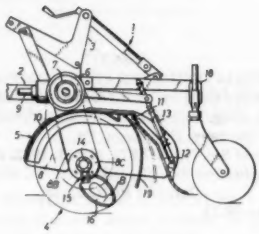
1. A conveyor arrangement for bulk material, the conveyor arrangement being mounted on a track for mobility therealong in an operating direction and comprising a track-bound vehicle extending longitudinally in said direction, a conveyor means arranged on the vehicle for receiving the bulk material and extending in said direction, the conveyor means comprising a bulk material storage and conveyor band having an input end arranged to receive the bulk material, a storage container for the received bulk material at the input end, the container being open on top and extending in the direction of conveyance of the bulk material, a drive for the conveyor band, a drive control for adjusting the speed of the conveyor band between a maximum and zero whereby conveyance of the bulk material on the conveyor band may be selectively shut off or slowed for temporary storage of the bulk material thereon, and a continuously driven conveyor band arranged to feed the bulk material to the conveyor band inlet end and into the storage container.

4,556,113

STRUCTURE FOR ATTACHING TINES FOR CULTIVATION BY REVERSIBLE ROTATION IN ROTARY CULTIVATING APPARATUS

Taro Saito, Osaka; Kazumi Umeki, Sakai; Takaaki Ohno, Sakai; Hirobumi Sakane, Sakai; Masahide Tsujino, Sakai; Keiichi Sanpei, Izumiohtsu; Yoshibumi Nagamine, Habikino, and Yoshitaka Sato, Sakai, all of Japan, assignors to Kubota Ltd., Osaka, Japan

Filed Nov. 2, 1983, Ser. No. 547,944
Claims priority, application Japan, Nov. 6, 1982, 57-195011
Int. Cl.[4] A01B *33/02, 33/14*
U.S. Cl. 172—91 **7 Claims**



1. In a rotary cultivating apparatus, a structure for attaching tines for cultivation by reversible rotation wherein the tines are attached, each at its base portion, to a tine shaft reversibly rotatable about a lateral axis, the tine including a blade portion and edge portions for forward rotation and reverse rotation formed at opposite sides of the blade portion, the structure being characterized in that the base portion of the tine is supported by tine mount members on the tine shaft and is pivotally movable about a lateral axis, holding means provided between the tine shaft and the tine for holding the tine in a forward inclined position wherein the forward end of the tine is positioned rearward from its base portion with respect to the direction of forward rotation or in a reverse inclined position wherein the forward end of the tine is positioned rearward from its base portion with respect to the direction of reverse rotation, said holding means including a spacer provided between a pair of mount members secured to the tine shaft and having engaging portions which form an angular projection and engaged portions formed in an angular shape at the base of the tine and each adapted to bear on the corresponding one of the engaging portions of the spacer, the base portion of the tine being provided between the tine mount members pivotably about the second lateral axis, each of the engaged portions being engageable by the corresponding portion of the spacer, means provided between the tine and the tine shaft for imparting a resistant force to the tine to prevent the tine from being brought into pivoted position intermediate between the forward inclined position and the reverse inclined position by a centrifugal force resulting from the rotation of the tine shaft, the resistant force imparting means being adjustable to a resistant force smaller than the reaction produced when tine is driven into the soil by forward rotation or reverse rotation.

4,556,114

SOIL SAMPLER DEVICE

Michael C. Ryan, Box 426, Mitchellville, Iowa 50169

Filed Mar. 30, 1983, Ser. No. 480,251
Int. Cl.[4] E21B *25/00;* **A01B** *45/06*
U.S. Cl. 175—20 **6 Claims**

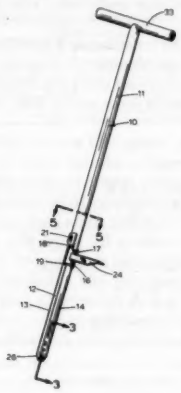
1. A soil sampler device comprising:

(a) an elongated tubular body member having a main section and a soil receiving section,

(b) said soil receiving section including a pair of transversely opposite half portions one of which forms a stationary extension projected longuitudinally from said main section and the other of which an extension movable into and out of a tube closing relation with said stationary extension,

(c) means movably supporting said movable extension on said main section for movement into and out of said tube closing relation,

(d) a foot rest member secured to and projected laterally outwardly from said movable extension, and



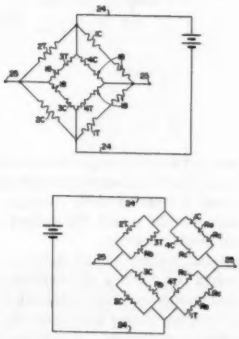
(e) coacting means on said stationary extension and movable extension on the opposite side of the movable supporting means from said foot rest for guiding said movable extension into said tube closing relation in response to pressure applied on said foot member for ground insertion of said soil receiving section.

4,556,115

METHOD AND MEANS FOR EQUALIZING THE MEASURING SENSITIVITY OF A PLURALITY OF STRAIN GAGE TRANSDUCERS

Harry E. Lockery, Sudbury, and Edward Freymiller, Lynnfield, both of Mass., assignors to Hottinger Baldwin Measurement, Inc., Framingham, Mass.

Filed Jun. 17, 1983, Ser. No. 505,395
Int. Cl.[4] G01G *3/14, 19/52;* **G01L** *1/22, 25/00*
U.S. Cl. 177—211 **2 Claims**



1. A method for desensitizing the load measuring sensitivities of a plurality of strain gages forming at least two full bridge circuits relative to each other to provide uniform load measuring sensitivities with due regard to a shunting interacting effect resulting when said strain gages are electrically interconnected

for forming at least two pairs of half bridges which in turn are electrically interconnected to form said at least two full bridges, said strain gages being secured in pairs to at least four load measuring beams forming a load measuring device, comprising the following steps:

(a) successively applying a standardized load to each of said load measuring beams for determining the strain gage pairs having the lowest sensitivity and the strain gage pairs having higher sensitivities relative to said lowest sensitivity;

(b) determining, by calculation, a sensitivity change value representing said shunting interacting effect resulting from connecting at least two pairs of half bridges in parallel to each other to form said at least two paralleled full bridges,

(c) calculating, by taking into account said higher sensitivities and said sensitivity change value, for each strain gage pair having a higher sensitivity than said lowest sensitivity, desensitizing resistances to be connected in series with the respective one of said strain gage pairs having a higher sensitivity for reducing the respective higher sensitivity and for neutralizing said shunting interacting effect, and

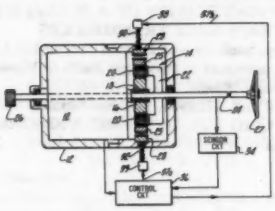
(d) electrically connecting said calculated desensitizing resistances in series with the respective strain gage pairs for achieving said desensitizing of said strain gages and said neutralizing of said shunting interacting effect, simultaneously.

4,556,116

FAIL-SAFE MECHANISM FOR AN ELECTRICAL POWER ASSISTED STEERING SYSTEM

Walter K. O'Neil, Birmingham, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Aug. 30, 1984, Ser. No. 646,368
Int. Cl.[4] B62D *5/00*
U.S. Cl. 180—79.1 **6 Claims**



1. A power assisted steering system for a vehicle, the vehicle having an operator controlled steering mechanism, at least one steered wheel and a steering shaft directly connecting the steering mechanism to the wheel, the system comprising:

a bidirectional electric motor;

control means for energizing the motor to turn in a first direction when the steering mechanism is moved in one direction by the operator, for energizing the motor to turn in a direction opposite said first direction when the steering mechanism is moved in a direction opposite said one direction by the operator, for monitoring the operational condition of the system to detect malfunctions, and for generating a signal indicative of the operational condition system;

clutch means, responsive to the control means for coupling the motor to the steering shaft when the system is operating properly, and for isolating the motor from the steering shaft when the system is not operating properly; and

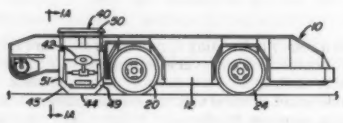
a ratio reduction means connected betwen the motor and the steering shaft for increasing the torque delivered to the steering shaft by the motor, the ratio reduction means including a planetary gear system comprising a sun gear, a plurality of planet gears in circumferential mesh with the sun gear, a ring gear surrounding and in mesh with the planet gears, and planet carriers connecting the planet gears to the steering shaft so that revolution of the planet gears about the sun gear produces a corresponding rotation of the steering shaft.

4,556,117

FREE FLOATING OPERATOR COMPARTMENT

G. Robert Frey; Gregory M. Chandler, both of Franklin, and Richard A. King, Emlenton, all of Pa., assignors to Joy Manufacturing Company, Pittsburgh, Pa.

Continuation of Ser. No. 437,972, Nov. 1, 1982, abandoned. This application Sep. 20, 1984, Ser. No. 652,424
Int. Cl.[4] B62D *33/06*
U.S. Cl. 180—89.13 **6 Claims**



1. A suspension system for the operator compartment of a mine vehicle having a body, said compartment attached to a side wall of said vehicle body, said compartment capable of free floatation with respect to said body as said vehicle traverses said mine floor, said compartment having a rear wall adjacent said body side, said system comprising:

a vertically extending guide means in said side wall of said body of said vehicle; and

a single vertically extending rail structure for providing the sole guide and support of said operator compartment in said guide means, said rail structure centrally located on said rear wall of said operator's compartment, said rail structure allowing vertical sliding movement of said operator's compartment within said guide means as said compartment traverses said mine floor independent of the vertical movement of said vehicle body.

4,556,118

TILT LOCKOUT SYSTEM FOR TILT-CAB TRUCKS

Alvan G. London, Camdenton, Mo., assignor to Applied Power, Brookfield, Wis.

Continuation of Ser. No. 344,378, Feb. 1, 1982, abandoned. This application May 29, 1984, Ser. No. 614,706
Int. Cl.[4] B62D *27/04, 33/06*
U.S. Cl. 180—89.15 **6 Claims**

1. In a tilt-cab truck comprising:

(a) a chassis;

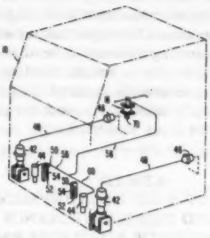
(b) a cab mounted on said chassis and pivotable with respect to said chassis about an axis;

(c) first means for tilting said cab about said axis back and forth between a lowered first position and a raised second position; and

(d) shock absorber and spring means between said chassis and said cab located in the vicinity of said axis,

the improvement comprising second means to extend said

shock absorber and spring means to their maximum stroke prior to activation of said first means to initiate a tilting cycle



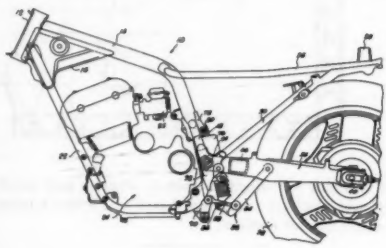
and to lock said shock absorber and spring means to their maximum stroke throughout the tilting cycle.

4,556,119

MOTORCYCLE STRUCTURE

Kouji Shiratsuchi, Saitama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 412,571, Aug. 30, 1982, abandoned. This application Nov. 5, 1984, Ser. No. 668,680
Claims priority, application Japan, Sep. 4, 1981, 56-138612
Int. Cl.[4] B62K *25/26*
U.S. Cl. 180—219 **2 Claims**



1. A structure for a motorcycle having a centrally mounted engine, comprising:

a head pipe;

a backbone frame member fixed at a first end to said head pipe and including a first segment extending rearwardly over the engine and second segment depending downwardly behind the engine;

an inverted U-shaped center frame member fixed to the end of said second segment and having parallel leg portions extending downwardly behind the engine;

two pivot mechanisms laterally spaced and mounted respectively to the parallel leg portions of said center frame member;

a rear fork assembly having two forwardly extending, laterally spaced members mounted to said pivot mechanisms to pivotally mount said rear fork assembly on the parallel leg portions of said center frame member and link members connected to said rear fork assembly; and

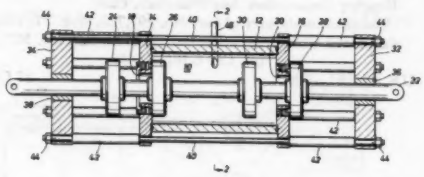
a cushion member fixed at a first end to said center frame member and at a second end to said link members to move upwardly with upward pivotal movement of said rear fork assembly and being aligned with said second segment of said backbone frame member, said cushion member extending adjacent to the rearmost portion of the engine and between the parallel leg portions of said center frame member.

4,556,120

MODULAR GAS-POWERED SUBSEA SEISMIC SOURCE

Robert A. Kirby, Houston, Tex., assignor to Exxon Production Research Co., Houston, Tex.

Filed Jun. 20, 1983, Ser. No. 505,642
Int. Cl.[4] G01V *1/137, 1/38*
U.S. Cl. 181—120 **19 Claims**



1. A marine seismic source for producing a seismic pulse in a body of water by the release of a pressurized gas comprising:

a source module further comprising:

a shuttle which includes:

a shuttle rod, and four substantially cylindrical valve plates mounted on the shuttle rod,

a gas-holding chamber disposed about two of said valve plates and a portion of said shuttle rod, said gas-holding chamber having two opposing ends with a sealable exhaust port positioned in each end, said shuttle rod passing through both sealable exhaust ports, said shuttle moveable through a stroke, the valve plates positioned on said shuttle rod such that one of the valve plates about which the gas-holding chamber is disposed and one of the other valve plates seal both exhaust ports at each end of said stroke, each exhaust port being open as the shuttle passes through the stroke, and

means for introducing pressurized gas to the gas-holding chamber, said pressurized gas released as the shuttle passes through said stroke; and

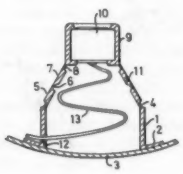
an actuator module for moving the shuttle through the stroke.

4,556,121

HOLDER

Tore Palmaer, Postfach 100, CH-6340 Baar, Switzerland; Leif Palmaer, Kristinagatan 14, S-331 00 Värnamo, and Björn Jacobsson, Bor, both of Sweden, assignors to Tore Palmaer, Switzerland and Leif Palmaer, Sweden

Filed Feb. 29, 1984, Ser. No. 584,641
Int. Cl.[4] H04R *25/00*
U.S. Cl. 181—129 **8 Claims**



1. A holder for securing a microphone or earpiece inside a helmet, ear muff or the like, said holder comprising a plurality of tubular rings of soft flexible material, one ring being adapted to be connected to a shell of the helmet, ear muff or the like, the rings being serially connected by resilient, short, thin, soft segments, the rings being dimensioned and arranged so that they can be nested within each other or pulled out to form an extending holder, there being means to connect a microphone or earpiece to one of said rings; the soft segments having different degrees of hardness, so that certain segments are folded or straightened out in a predetermined sequence when the holder

is pushed into the nested position or pulled out to the extending position respectively.

4,556,122

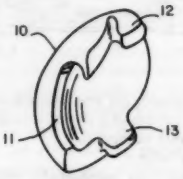
EAR ACOUSTICAL HEARING AID

Richard L. Goode, Los Altos, Calif., assignor to Innovative Hearing Corporation, San Francisco, Calif.

Continuation-in-part of Ser. No. 297,723, Aug. 31, 1981, abandoned. This application Dec. 2, 1983, Ser. No. 557,701

Int. Cl.⁴ G10K *11/26*

U.S. Cl. 181—136 **17 Claims**



1. An acoustical hearing aid adapted for use in a human ear, comprising:

a chamber having an opening on its surface to admit sound and an opening to pass sound to the inner ear, the chamber adapted to fit into the concha of the human ear and comprising a sound resonator having a bandwidth of several hundred hertz serving to shift a normal resonant frequency of the concha downward; and

chamber extensions adapted to hook over the upper and lower aspects of the concha of the ear thus attaching said chamber to the auricle of the ear.

4,556,123

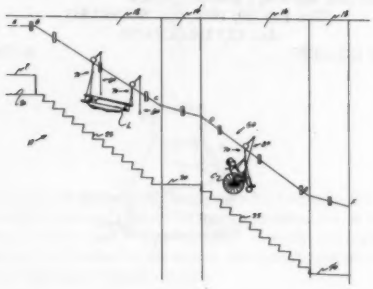
PATIENT EVACUATION SYSTEM FROM A MULTISTORY STRUCTURE

Thomas S. Hargest, III, 330 Concord St., Charleston, S.C. 29401

Filed Jul. 5, 1984, Ser. No. 628,025

Int. Cl.⁴ A62B *1/20*

U.S. Cl. 182—36 **26 Claims**



1. A patient evacuation system comprising:

(a) a trackway means mountable in a stairwell at a height that normal use of stairs located in the stairwell will not be impaired thereby, said trackway means including a hanger rail support and mounting means secured thereto, said mounting means being adaptable for securement within said stairwell above said stairs;

(b) hanger means associable with said trackway said hanger means having roller means received thereon for receipt on said hanger rail support, and brake means normally in braking engagement with said roller means;

(c) means associated with said hanger means for removable securement of a patient carrying element thereto; and

(d) brake release means associated with said brake means, said brake release means having actuator means accessible to said patient carrying element to be supported by said hanger means; whereby a patient residing in a patient carrying element removably secured to said securement means may be suspended from said hanger means for controlled descent along said trackway.

4,556,124

MACHINE MADE OF A SET OF EQUIPMENT FOR THE INSPECTION AND THE MAINTENANCE OF THE LOWER SURFACES OF ROAD AND RAILWAY BRIDGES, AS WELL AS VIADUCTS AND THEIR RESPECTIVE PIERS

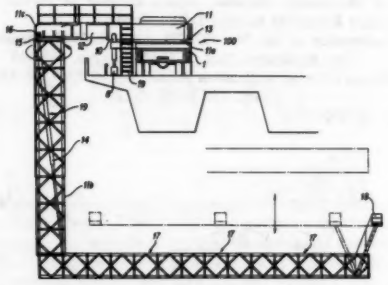
Sergio Lotto, Via Marco Antonio Calza n. 7, Padova, Italy

Filed Nov. 25, 1983, Ser. No. 555,087

Claims priority, application Italy, Nov. 26, 1982, 41680 A/82

Int. Cl.⁴ E04G *1/36*

U.S. Cl. 182—63 **17 Claims**



3. A machine as defined in claim 1, wherein said tower not having said platform comprises a pair of members telescopingly engaging one another.

4,556,125

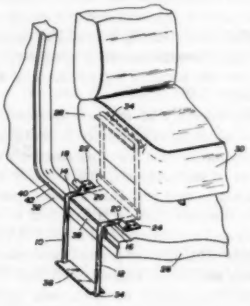
METHOD OF INSTALLING A PIVOTAL LADDER TO A VEHICLE

Roy J. Johnson, P.O. Box 332, Barons, Alberta, Canada (T0L 0G0)

Filed Feb. 28, 1984, Ser. No. 584,317

Int. Cl.⁴ B60R *3/02*

U.S. Cl. 182—91 **3 Claims**



1. A method of installing a pivotal ladder for a vehicle,

pivotal from an extended position in which the ladder hangs down from a vehicle doorway to a retracted position in which the ladder is pivoted to a location inside said vehicle doorway, comprising:

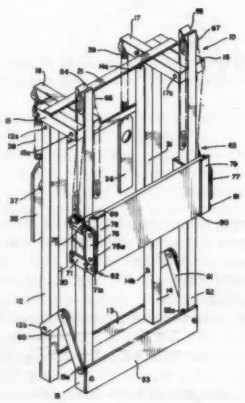
(a) fabricating the ladder so that its length is shorter than the height of a seat of said vehicle; and p1 (b) mounting the ladder to a floor of a vehicle adjacent said seat between said seat and the vehicle doorway such that in its retracted position the ladder is juxtaposed to a side of said seat with its distal end below a top surface of said seat and such that an occupant of the vehicle can exit from the doorway without interference from the ladder when it is in its retracted position.

4,556,126

ADJUSTABLE VEHICLE PLATFORM FOR A MECHANIC

William R. Wait, 1906 Katahn, Prescott, Ariz. 86301

Filed May 8, 1985, Ser. No. 732,029
Int. Cl.[4] B25H *5/00*
U.S. Cl. 182—150 **19 Claims**



1. A portable mechanic's stand for supporting a mechanic at the side of a vehicle tire and above the supporting surface for said tire comprising elongated upright tire bar means, a platform, means interconnecting said platform and said upright tire bar means for supporting said platform by said upright tire bar means, and clamping means for suspending said upright tire means from the top portion of said tire and for securely holding said upright tire bar means against the outer wall of said tire, said clamping means comprising:

(a) horizontal tire bar means connected near one end thereof to the upper end of said upright tire bar means, said horizontal tire bar means having a polygonal cross-section and adapted to extend across the top of said tire and beyond the plane of the inner wall of said tire;

(b) elongated generally planar locking plate means having an opening therethrough, said opening being sized to permit the horizontal tire bar to be inserted therein and have edges of the opening contact a plurality of corners of the horizontal tire bar when the plane of the locking plate means is tilted from the perpendicular with respect to the axis at the tire bar means, whereby the locking plate is restricted from sliding on the horizontal tire bar when the tire bar is tilted from said perpendicular; and

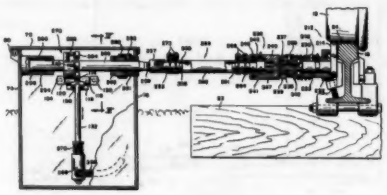
(c) means interconnecting said locking plate to a position at or near an upper end of said upright tire bar means to urge said locking plate into a tilted position with respect to said horizontal tire bar means.

4,556,127

RAILWAY TRACK LUBRICATOR

Richard B. Doorley, Pittsburgh; Paul J. Henninger, Allison Park; Chester F. Klages, Jr., Evans City, and Jerrold K. Shetter, Saxonburg, all of Pa., assignors to Trak-Tech, Inc., Zelienople, Pa.

Filed Oct. 17, 1983, Ser. No. 542,755
Int. Cl.[4] B61K *3/00*
U.S. Cl. 184—3.1 **16 Claims**



1. A method for lubricating the rail of railway track comprising the steps of,

supporting a ram lever adjacent a rail of the track for movement between a raised position and a depressed position,

transmitting rotation of a shaft in a preselected direction during upward movement of the ramp lever from the depressed position to the raised position,

interrupting transmission of rotation of the shaft during downward movement of the ramp lever from the raised position to the depressed position,

restraining rotational movement of the shaft in a direction opposite to said preselected direction upon downward movement of the ramp lever,

permitting rotational movement of the shaft in said preselected direction upon upward movement of the ramp lever,

rotating a support member having a plurality of radially positioned cam rollers thereon by the rotation of the shaft,

actuating a cam lever by the cam rollers upon rotational movement of the shaft to actuate a lubricant pump upon upward movement of the ramp lever to convey lubricant to the surface of the rail, and

preventing actuation of the lubricant pump during downward movement of the ramp lever.

4,556,128

WHEELCHAIR LIFT

Graham R. Thorley, La Mesa, and Donald B. Sullivan, San Diego, both of Calif., assignors to Lift-U-Inc., Kent, Wash.

Division of Ser. No. 268,466, May 29, 1981, which is a continuation-in-part of Ser. No. 41,943, May 24, 1979, Pat. No. 4,251,179, which is a continuation-in-part of Ser. No. 885,714, Mar. 13, 1978, Pat. No. 4,176,999, which is a continuation-in-part of Ser. No. 769,636, Feb. 17, 1977, Pat. No. 4,081,091, which is a continuation-in-part of Ser. No. 606,137, Aug. 20, 1975, Pat. No. 4,027,807. This application Sep. 27, 1982, Ser. No. 423,930
Int. Cl.[4] B66B *9/20*
U.S. Cl. 187—9 R **6 Claims**

1. A lift assembly commuting between an upper level and a lower level alternatively as a stair or as a vertically adjustable platform, said lift assembly comprising:

(a) an elevator assembly;

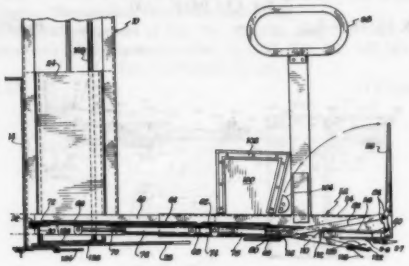
(b) a horizontal extension frame for supporting a horizontal extension assembly, said frame being mounted on said elevator assembly for vertical movements;

(c) a plurality of articulate panels defining said stair and extensible as part of a platform;

(d) the panel which is outermost when extended having a safety barrier pivoted substantially at the outer edge thereof and being pivotal from an inwardly directed mode

folded against said outermost panel acting as a part of said stairs, through an upright position effectively deployed as a safety barrier, to an outwardly extended position defining a ramp continuation of said outermost panel; and

wherein said outermost panel is hinged on the edge opposite the edge mounting said safety barrier to a panel acting as the



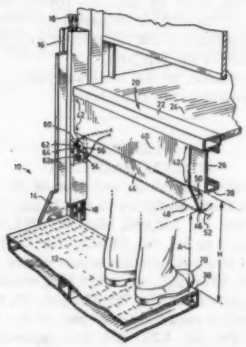
riser panel of a step of said stair, and said riser has a projecting rod extending down beneath said outermost panel when in said stair mode, and including an actuator rod and a pivotal linkage on said safety barrier such that upon deployment of said panels as a platform, said extending rod forces said actuator rod to pivot said safety barrier into the upright position.

4,556,129

TRIP MECHANISM FOR DE-ACTIVATING ELEVATOR PLATFORMS

John C. Martin, Toronto, Canada, assignor to Diesel Equipment Limited, Toronto, Canada

Filed Feb. 6, 1984, Ser. No. 576,930
Claims priority, application Canada, Feb. 7, 1983, 421050
Int. Cl.[4] B66B *1/00*
U.S. Cl. 187—41 **4 Claims**



1. In an elevator device having first and second platforms mounted in a frame for movement relative to one another wherein a nip is formed between a lower edge of the first platform and an upper edge of the second platform as they move toward one another and wherein an electrically operated control circuit is provided for controlling the movement of the platforms relative to one another, the improvement of:

(a) a flexible skirt extending below said lower edge of said first platform across the width of said nip whereby during movement of the platform to close the nip, the trip means will be engaged by and deflected by any object which may project into said nip,

(b) a circuit breaker means operable to de-activate said control circuit, said circuit breaker means comprising a pair of fuse members arranged one at either end of said nip,

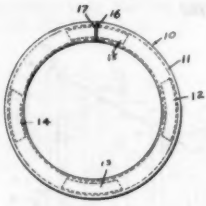
(c) a trip wire extending from each end of the flexible skirt and mechanically engaging each fuse member and being effective to de-activate at least one of said fuse members to de-activate said control circuit when said trip wire is deflected to an extent less than that required to permit said object to be clamped between said first and second platforms to stop the closing of the nip in use.

4,556,130

VIBRATION DAMPER AND METHOD OF MAKING THE SAME

Stanley Puszakowski, 3348 Babcock Blvd., Pittsburgh, Pa. 15237

Continuation of Ser. No. 412,400, Aug. 30, 1982, abandoned.
This application Aug. 6, 1984, Ser. No. 638,357
Int. Cl.[4] F16F *15/12*
U.S. Cl. 188—218 A **1 Claim**



1. A vibration damper for use on a brake rotor comprising an elastic tube having ends and an intermediate part made of latex material having an inside space and formed into a loop with said ends adjacent each other,

a plurality of weights,

said weights being in the form of elongated generally cylindrical members,

said weights being coated with cement and being received in said space in said tube which said coating provides a lubricant for said weights to slide during assembly,

said weights being made of ductile flexible material and being bent to a curvature equal to the curvature of the outside of said rotor,

said weights having a cross sectional area approximately equal to the cross sectional area of said space in said tubing whereby said weights resist movement,

said tubing being disposed in the form of a circle with its ends adjacent each other,

one said weight being received in the adjacent ends of said tubing,

said tubing being disposed in a continuous loop of slightly lesser circumference than the circumference of said brake drum,

said weights being held in place in said tube by said cement material,

said weights being equally spaced from each other,

all of said weights being of substantially the same weight.

4,556,131

DOUBLE OUTPUT TORQUE LIMITER

John R. Chapman, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Oct. 11, 1983, Ser. No. 541,358
Int. Cl.[4] F16D *59/00*
U.S. Cl. 192—7 **12 Claims**

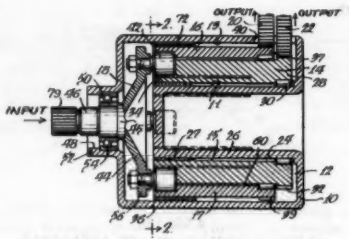
1. An apparatus for limiting torque applied by a driving member to a driven member comprising:

first and second torque members having coincident rotational axes and positioned one radially inside the other;

first and second braking surfaces respectively on the first and second torque members;

a housing having first and second braking surfaces spaced radially apart with respect to the axes of the torque members and facing, respectively the first and second braking surfaces on the torque members for engagement therewith;

first means interconnecting said driven member with at least one of said first and second torque members whereby rotation of the one of said first and second torque members drives said driven member;



second means for imparting rotational movement from said driving member to said first and second torque members; and

third means for simultaneously engaging said first and second braking surfaces on the torque members with the corresponding braking surfaces on the housing and fixing the position of the first and second torque members relative to the housing at a predetermined torque to prevent excessive torque on the driven member.

4,556,132

ADJUSTABLE ELECTROMAGNETIC CLUTCH/BRAKE

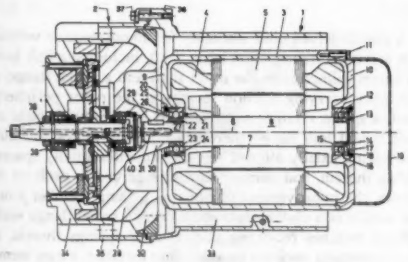
Karl Lengsfeld, Plankstadt; Erich Link, Brühl, and Hans Erndt, Wiesloch, all of Fed. Rep. of Germany, assignors to Frankl & Kirchner GmbH & Co. and KG Fabrik fur Electromotoren u. Electrische Apparate, both of Schwetzingen, Fed. Rep. of Germany

Filed Jul. 27, 1982, Ser. No. 402,351

Claims priority, application Fed. Rep. of Germany, Aug. 4, 1981, 3130819

Int. Cl.⁴ B60K *41/24*; F16D *13/75*

U.S. Cl. 192—12 BA **18 Claims**



1. An electromotive control drive for a sewing machine, comprising a motor capable of continuous drive, a driven output shaft, and a clutch/brake unit selectively interconnecting said motor and said driven shaft, said clutch/brake unit comprising a single clutch/brake disk, said disk comprising clutch disk means, means to fix said disk to said driven shaft, clutch lining means fixed to the rotor of said motor and normally positioned with an air gap between said clutch lining means and said clutch disk means, means to automatically readjust the size of said clutch air gap, said single disk further comprising brake means adapted to frictionally contact a fixed portion of said drive to brake the motion of said motor and separate clutch coil means and brake coil means for individually operating said single disk to operate the brake and the clutch of said drive.

4,556,133

FRICTION CLUTCH

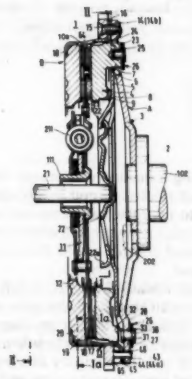
Lothar Huber, Bühl, Fed. Rep. of Germany, assignor to Luk Lamellen und Kupplungsbau GmbH, Bühl, Fed. Rep. of Germany

Filed Mar. 26, 1984, Ser. No. 593,624

Claims priority, application Fed. Rep. of Germany, Mar. 25, 1983, 3310972; May 26, 1983, 8308978[U]; May 26, 1983, 3347912

Int. Cl.⁴ F16D *13/58*

U.S. Cl. 192—70.16 **40 Claims**



1. A friction clutch, particularly for use in motor vehicles, comprising a substantially disc-shaped rotatable support arranged to receive torque from the output element of an engine and having a first and a second side; an axially movable pressure plate adjacent to one side of said support; a diaphragm spring interposed between said pressure plate and said support and having an outer portion, as considered radially of said pressure plate, reacting against said support and a radially inner portion bearing against said pressure plate; means for transmitting torque between said support and said pressure plate; a counterpressure plate having a first side facing toward and a second side facing away from said pressure plate; a clutch disc interposed between said pressure plate and said counterpressure plate; and distancing means including a sheet metal component rigidly connecting said counterpressure plate to said support and having a clamping portion engaging the second side of said counterpressure plate.

4,556,134

POWER TRANSMISSION SYSTEM FOR A FOUR-WHEEL DRIVE VEHICLE

Toshio Takano, Hamuramachi, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 27, 1983, Ser. No. 461,332

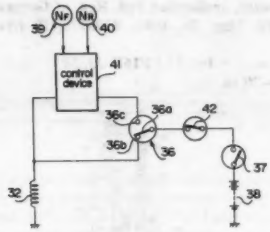
Claims priority, application Japan, Jan. 29, 1982, 57-13555

Int. Cl.⁴ F16D *25/14, 43/284*

U.S. Cl. 192—103 F **6 Claims**

1. In a power transmission system for a four-wheel drive vehicle powered by an engine, having a transmission for transmitting the power of said engine to main driving wheels of said four-wheel drive vehicle, a hydraulically operated clutch when engaged for transmitting the power of said engine to

auxiliary driving wheels of the vehicle simultaneously with the transmitting by the transmission of the power of said engine to the main driving wheels, a hydraulic circuit for supplying oil to said hydraulically operated clutch, a solenoid operated valve provided in said hydraulic circuit, an electric circuit including a solenoid of said valve, sensors for detecting speeds of said main driving wheels and said auxiliary driving wheels, respectively, and control means automatically responsive to a predetermined difference between said speeds of said main driving wheels and said auxiliary driving wheels for closing said electric circuit so as to energize said solenoid so as to close said hydraulic circuit to engage said clutch, the improvement comprising



means comprising a manually operated change-over switch for closing said electric circuit independent of said control means so as to energize said solenoid so as to close said hydraulic circuit to engage said clutch and simultaneously deactivating said control means from acting on said electric circuit, and

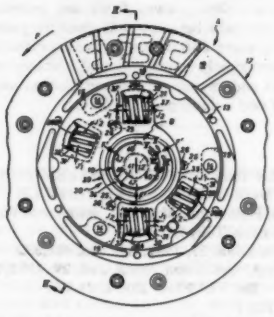
means comprising a manual cut-off switch for disconnecting said electric circuit so as to deenergize said solenoid so as to open said hydraulic circuit to disengage said clutch during inspection of the vehicle when the main driving wheels are free and the auxiliary driving wheels are fixed although one of said control means and said change-over switch is actuated in a manner to engage said clutch.

4,556,135

TORSION DAMPING DEVICE

Pierre Loizeau, Ville d'Avray, France, assignor to Valeo, Paris, France

Filed Sep. 20, 1983, Ser. No. 533,948
Claims priority, application France, Sep. 27, 1982, 82 16214
Int. Cl.[4] F16D *3/14*
U.S. Cl. 192—106.2 **8 Claims**



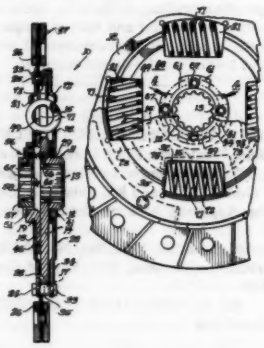
1. A torsion-damping device comprising at least two coaxial rotary parts mounted rotatably relative to one another within the limits of predetermined angular movement and against circumferentially acting elastic means arranged to act circumferentially between said parts, said circumferentially acting elastic means comprising at least one elastically deformable arm which extends between a first bearing element fixed for rotation with one of said rotary parts and a second bearing element having drive means for rotational connection with the other said rotary parts over at least a range of the predetermined angular movement, said arm being formed in a thin member in one piece with said bearing elements, wherein said first bearing element comprises at least two radially projecting barbs which are axially force-fitted in a bearing surface of said one rotary part, said first bearing element being radially and circumferentially elastically deformable between said projecting barbs.

4,556,136

CLUTCH DRIVEN PLATE ASSEMBLY

Thaddeus Lech, Jr., Farmington Hills, Mich., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Nov. 30, 1983, Ser. No. 556,517
Int. Cl.[4] F16D *3/14*
U.S. Cl. 192—106.2 **7 Claims**

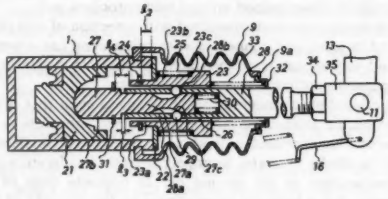


1. A clutch driven plate assembly for an automotive vehicle clutch driving a transmission input shaft, including a hub having a barrel splined onto the input shaft and a radial flange, a clutch plate carrying friction facings at the outer periphery thereof, a spring retainer plate secured to the clutch plate to sandwich said hub flange therebetween, said plates and hub flange having axially aligned sets of circumferentially spaced windows therein, and damper springs received in each set of windows, the improvement comprising a ramp member journalled within said clutch plate and having a radial flange with peripheral notches receiving said damper springs therein, a series of camming surfaces on said ramp member, a cam member splined onto said transmission input shaft and having complementary camming surfaces engaging the camming surfaces on said ramp member, said interengaging camming surfaces causing axial movement of said cam member upon rotation of said ramp member, said hub flange spring windows extending circumferentially beyond said plate spring windows to allow limited rotation of said plates relative to said hub without compression of said damper springs, rotation of said plates and damper springs causing rotation of said ramp member resulting in axial movement of said cam member.

4,556,137
CLUTCH CLEARANCE UNIFORMING DEVICE

Minoru Abe, Katano, Japan, assignor to Kabushiki Kaisha Daikin Seisakusho, Neyagawa, Japan

Filed Nov. 15, 1983, Ser. No. 551,795
Claims priority, application Japan, Nov. 15, 1982, 57-173456[U]
Int. Cl.⁴ F16D *13/75*
U.S. Cl. 192—111 A **4 Claims**

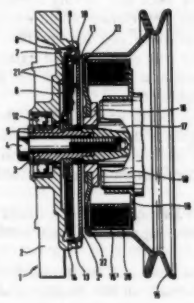


1. A clutch clearance uniforming device having a piston fitted freely slidingly in a slave cylinder, an annular holder plate contacting with an open end surface of said slave cylinder, a sleeve fitted in a central hole of said holder plate and slidable relatively to the slave cylinder by a fixed distance in the axial direction, a first release rod fitted into said sleeve and one end thereof pressing on said piston, a second release rod fitted likewise into said sleeve and slidable relatively to said first release rod, a compression spring interposed between a pair of said release rods, and a lock ball integrating the sleeve and the pair of release rods by means of elastic force of said spring at the time when said compression spring stretches; charactarized by that a stopper for preventing the lock ball from slipping out of the sleeve is provided on said first release rod, and at the same time a spring for holding the position of the holder plate is provided on the second release rod.

4,556,138
FLUID FRICTION CLUTCH

Hans Martin, Stuttgart, and Gerhard Stuetz, Renningen, both of Fed. Rep. of Germany, assignors to Sueddeutsche Kuehlerfabrik, Julius Fr. Behr GmbH & Co. KG, Stuttgart, Fed. Rep. of Germany

Filed Nov. 23, 1983, Ser. No. 554,811
Claims priority, application Fed. Rep. of Germany, Nov. 27, 1982, 8233338[U]
Int. Cl.⁴ F16D *35/00*
U.S. Cl. 192—58 B **9 Claims**

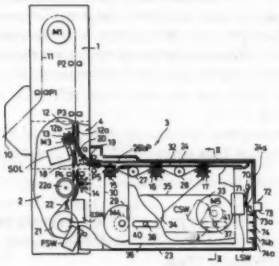


1. A fluid friction clutch assembly, comprising:
a drive shaft;
a primary disk mounted for rotation on said drive shaft;
a driven clutch housing surrounding said primary disk and being rotatably supported with respect to said drive shaft, said clutch housing containing a partition therein defining a work chamber and a reservoir separated by the partition, said partition including in its radially outer area at least one overflow opening closeable by means of a valve lever comprised of a magnetic material and a return flow orifice associated with pump means for pumping a viscous torque-transmitting medium from the work chamber to the reservoir;
a pulley member mounted on said drive shaft for driving said shaft;
means, associated with said pulley member, for selectively magnetically actuating said valve lever for selectively opening and closing said overflow opening, said means for actuating including an annular magnet arranged coaxially within said pulley member, wherein said annular magnet has an electromagnetically effective radius which is located within the radial extent of said valve lever; and
means for reinforcing a magnetic flux of the annular magnet, located between the annular magnet and the valve lever, and disposed in either the pulley member, or the clutch housing, or both the clutch housing and the pulley member.

4,556,139
BILL ACCEPTING DEVICE

Masaki Akagawa, Sakado; Hideaki Onda, Ageo; Osamu Kobayashi, Sakado, and Kenji Nishiumi, Hannoh, all of Japan, assignors to Kabushiki Kaisha Nippon Coinco, Tokyo, Japan

Filed May 27, 1983, Ser. No. 498,841
Claims priority, application Japan, May 28, 1982, 57-89701
Int. Cl.⁴ G07F *7/04*
U.S. Cl. 194—4 C **13 Claims**



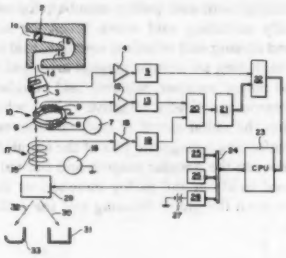
1. A bill accepting device comprising:
a bill discrimination section containing means for discriminating whether or not an inserted bill is true and for returning rejected bills, and having a bill passage through which bills can exit said discrimination section;
an escrow section into which bills can be received from said discrimination section for storage therein and for subsequent reissuance via said discrimination section;
a stocker section into which bills can be received from said discrimination section; and
passage switching means for causing said bill passage in said bill discrimination section to communicate selectively either directly with said escrow section or alternatively, directly with said stocker section.

4,556,140

METHOD AND APPARATUS FOR DISCRIMINATING COINS OR BANK NOTES

Kazuo Okada, Tokyo, Japan, assignor to Kabushiki Kaisha Universal, Tochigi, Japan

Filed Aug. 8, 1983, Ser. No. 521,381
Claims priority, application Japan, Aug. 6, 1982, 57-136305
Int. Cl.⁴ G07F *7/04*
U.S. Cl. 194—4 C **13 Claims**



1. A method of judging the genuineness of currency by measuring inherent characteristics thereof, comprising the steps of:

sampling a predetermined plurality of pieces of currency of the same denomination at least a plurality of which have been in circulation and thus differ from each other as to the extent of wear;

measuring the inherent characteristics of said predetermined plurality of pieces of currency of the same denomination with sensor means;

calculating minimum and maximum reference values for discriminating genuine currency from the measured values of the inherent characteristics of said predetermined number of sample pieces of currency;

storing the calculated minimum and maximum reference values;

measuring the inherent characteristics of a piece of currency to be discriminated with said sensor means;

comparing the measured inherent characteristics of the inspected piece of currency with the minimum and maximum reference values to determine the inspected piece of currency to be genuine if the measured values are between said minimum and maximum reference values and counterfeit if not,

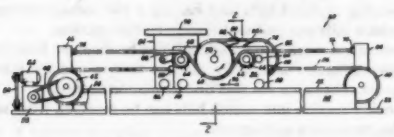
and separating currency thus determined to be genuine from currency thus determined to be counterfeit.

4,556,141

RECIPROCATING LINEAR CONVEYOR DRIVE

William M. Faitel, Pontiac, Mich., assignor to Lamb Technicon Corp., Warren, Mich.

Filed Aug. 18, 1983, Ser. No. 524,414
Int. Cl.⁴ B65G *25/00*
U.S. Cl. 198—750 **20 Claims**



19. A linear drive for a conveyor or the like comprising first and second cars and track means for guiding said cars in reciprocating, generally parallel paths,

means for reciprocating said first car through a predetermined stroke,

drive means on said first car rotated in response to movement thereof in said path,

a sprocket on said first car driven by said drive means for rotation about a first axis perpendicular to said path of travel,

a second sprocket journalled on said first car for rotation about a second axis parallel to and spaced from said first axis in the direction of said path,

an endless chain trained around said sprockets and

a link having one end connected with a section of said chain and its other end connected with said second car whereby said second car is reciprocated through its stroke in response to reciprocation of the first car,

said chain-link connection being arranged such that it traverses the arcuate peripheries of the two sprockets as the second car approaches or advances from the opposite ends of its stroke whereby to impart smooth acceleration and deceleration to the second car at opposite ends of its stroke and a velocity proportional to the velocity of the first car at the intermediate portion of its stroke.

4,556,142

LIGHTWEIGHT MODULAR CONVEYOR BELT

James M. Lapeyre, New Orleans, La., assignor to The Laitram Corporation, New Orleans, La.

Filed Jan. 12, 1983, Ser. No. 457,482
Int. Cl.⁴ B65G *17/10*
U.S. Cl. 198—822 **16 Claims**

1. A conveyor belt composed of a plurality of linked modules each of substantially identical pitch dimensions and each of integral plastic molded construction, each module comprising:

a plurality of linear parallel spaced link elements, the length of the module being equal to the length of the link elements, and the width of the module being determined by the number of link elements;

the link elements terminating in first and second pluralities of link ends, each link end being formed to circumscribe a pivot hole;

a grid structure integral with the link elements and disposed between the link ends and having longitudinal members integral with the link elements and extending along the length of the modules and having two cross members integral with the link elements and extending across the width of the module which separate and join longitudinal members and link elements;

the cross members being spaced along the length of the module and angularly disposed to provide sprocket recesses intermediate the pivot axes of the module and adapted to mate with corresponding sprocket teeth of a sprocket wheel;

the cross members having upper and lower surfaces coplanar with respective upper and lower surfaces of the link elements;

substantially all of said link ends including a projection extending transversely of the module toward a confronting link end and terminating short of the confronting link end by an amount to accommodate the link end of a mated module, each of the projections being on the same facing side of respective link elements, the opposite side of respective link elements being substantially flat and without projections, each of the projections having an opening

therethrough in alignment with the pivot hole of the associated link ends;

the modules being linked together by pivot rods with each module rotated 180° with respect to the mated modules such that the projections of each adjacent module extend in opposite directions, with the flat sides of the link ends of one module being in engagement with the flat sides of the link ends of mated modules to provide a line of pull through the pivot rod near the link elements;

predetermined link ends of the modules have no projections such that increased spacing is provided at the mated link ends at which there is no projection to accommodate belt attachments disposed within the increased spacing;

a plurality of side guards each having a relatively thin plate-like body and an outwardly extending pair of flanges, each flange having an opening therethrough, the flanges and openings being of the same pitch length as the associated modules;

the flanges being adapted to fit into the increased spacings of mated link ends and retained therein by the pivot rods.

4,556,143

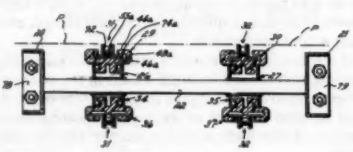
CONVEYOR

Peter A. Johnson, Everett, Wash., assignor to Figgie International Inc., Willoughby, Ohio

Continuation of Ser. No. 249,739, Mar. 31, 1981, abandoned. This application Nov. 22, 1983, Ser. No. 554,451

Int. Cl.⁴ B65G *17/00*

U.S. Cl. 198—841 **5 Claims**



1. A conveyor including:

at least two spaced apart side rails;

cross-tie means securing said two rails together in substantially equidistant relationship;

at least a first elongated mounting means extending in the same general direction as said side rails and including sidewalls and flanges defining an elongated, upright, U-shaped slot, said mounting means being disposed on said cross-ties;

a flexible propelling member;

a propelling member guide means disposed on said mounting means and extending in a similar direction thereto, said flexible propelling member movably mounted on said guide means, said guide means including an upper propelling member guide, support and capturing portion and lower mounting flanges disposed beneath said upper guide, support and capturing portion and having outwardly extending, elongated feet, said mounting flanges and said feet being slidably received and captured within said upright U-shaped slot;

wherein said flanges of said mounting means engage said propelling member guide means outwardly of said lower mounting flanges thereof; and

said sidewalls of said mounting means respectively extending downwardly from said propelling member guide means between respective outer edges thereof, and the respective outer edges of said outwardly extending feet.

4,556,144

TIDY ELEMENT PROVIDED WITH SEVERAL COMPARTMENTS

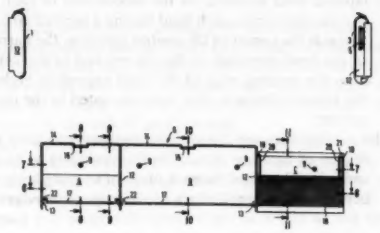
Renato Castelli, Ghent, Belgium, assignor to Samsonite Corporation, Denver, Colo.

Division of Ser. No. 416,477, Sep. 10, 1982, which is a continuation-in-part of Ser. No. 213,736, Dec. 5, 1980, abandoned. This application Jul. 3, 1984, Ser. No. 627,410

Claims priority, application Belgium, Dec. 18, 1979, 880684

Int. Cl.⁴ B65D *43/14, 51/04*

U.S. Cl. 206—214 **8 Claims**



1. In combination with an attache case having a lid, a portfolio secured in said case lid, said porfolio comprising a plurality of leaves connected by flexible strips forming a plurality of pockets, a tidy element mounted on a lower portion of an outer one of said leaves, said tidy element comprising an elongate one-piece molded plastic base secured to a lower portion of said one leaf and having a plurality of transverse partitions dividing said base into a plurality of compartments, and a molded plastic lid for at least one of said compartments, cooperating means on said base and compartment lid for hingedly connecting a lower portion of said compartment lid to said base, cooperating molded means on said compartment lid and base for retaining said compartment lid releasably in closed position, molded means on said compartment lid for releasing said compartment lid and moving said compartment lid to open position, said tidy element extending longitudinally of a lower portion of said portfolio and said portfolio comprising at least one pocket of lesser depth than a pocket formed by said one leaf, said pocket of lesser depth comprising a further leaf flexibly connected to an upper portion of said one leaf above said tidy element.

4,556,145

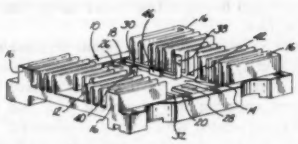
ONE PIECE FLATPACK CHIP CARRIER

Duane Putnam, Blaine, Minn., assignor to Control Data Corporation, Minneapolis, Minn.

Filed Mar. 28, 1985, Ser. No. 717,057

Int. Cl.⁴ B65D *73/02, 85/42*

U.S. Cl. 206—329 **19 Claims**



1. In a one piece flatpack chip carrier having a body portion having a central aperture, the central aperture having top, bottom and left and right sides, said body portion further having mounted thereon opposed channels extending from said left and right central aperture sides for retaining a flatpack chip's leads extending from a body, and means for releasably

retaining a flatpack chip in said carrier, an improved flatpack chip carrier comprising:

said means for releasably retaining a flatpack chip in said carrier comprising:

a pair of resilient cantilever arms having two ends, a first end of a first of said pair mounted on said top central aperture side and spaced from the center of said side in a first direction, a first end of a second of said pair mounted on said central aperture bottom side and spaced from the center of said side in a second direction equal and opposite to said first direction, each arm extending into said central aperture a predetermined distance; and

a tapered head mounted on the second end of each of said cantilevered arms, each head having a tapered edge facing towards the center of the central aperture, the narrow end of the head mounted on the second end of the cantilever arm, the tapered edge of the head extending higher than the top of a flatpack chip body mounted in the one piece carrier;

the spacing between the resilient cantilevered arms and the degree of tapering of said heads combining to resiliently and releasably hold flatpack chips of varying body widths between the tapered edges of the respective edges.

4,556,146

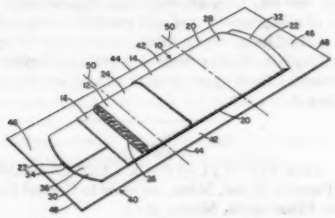
INDIVIDUALLY PACKAGED DISPOSABLE ABSORBENT ARTICLE

James L. Swanson, West Chester, Ohio, and Raymond L. Bendure, Kobe, Japan, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Feb. 8, 1984, Ser. No. 578,247

Int. Cl.[4] A61F *13/16*

U.S. Cl. 206—440 **6 Claims**



1. An individually packaged disposable absorbent article comprising:

an absorbent pad having a first major surface and a second major surface;

an envelope sheet comprising a liquid permeable topsheet portion overlaying said first major surface and a backsheet portion overlaying said second major surface said envelope sheet encasing said absorbent pad, said backsheet portion being coated with a layer of adhesive;

a perimeter having longitudinal perimeter segments; and

a wrapper, said wrapper being releasably affixed to said backsheet portion of said envelope sheet and having longitudinal flap portions extending outward from said longitudinal perimeter segments,

said absorbent pad and said wrapper being folded as a unit about at least two fold-axes and said longitudinal flap portions being frangibly sealed.

4,556,147

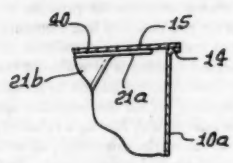
FRESH FRUIT PACKAGE

Robert O. Magnussen, Jr., 20442 Lake Canyon Dr., Walnut, Calif. 91789

Filed Feb. 4, 1985, Ser. No. 698,119

Int. Cl.[4] B65D *77/00*

U.S. Cl. 206—493 **4 Claims**



1. In a package for fresh fruit characterized as having a lower surface forming an upward, re-entrant recess, the combination comprising

(a) a cup-shaped container to receive said fruit,

(b) first locating means in the container to project upwardly into said recess, thereby to position the lower extent of the fruit, limiting its sideward movement relative to the container,

(c) and second locating means in the container to engage the upper extend of the fruit, thereby to position same limiting its sideward movement relative to the container, said second means including a deformable sheet,

(d) said container having a thin side wall and thin bottom wall and consisting of synthetic resin, the side wall comprising four substantially flat side wall portions joined by four outwardly convex corner wall portions, all such wall portions tapering downwardly, to join the bottom wall at outwardly convex corners, the side wall portions and corner wall portions turning outwardly at their uppermost extents to form a continuous peripheral flange, extending about a container mouth,

(e) and a tear-off lid removably attached to said flange and retaining said second locating means in the container, the lid being removable from the flange by tear-off to thereby allow upward removal of the second locating means and removal of the fruit in the container via the container mouth,

(f) said container wall portions being sized to closely surround said fruit, in spaced relation thereto, said second locating means having a centrally located conical projection to downwardly enter a re-entrant recess defined by the upper extent of said fruit, said projection having a downwardly domed convex terminus, said lid having a projecting tab adapted to be pulled upwardly to remove the lid from the container, said first locating means having a centrally located, generally conical projection to upwardly enter said upwardly re-entrant recess, said projection having an upwardly domed convex terminus,

(g) said removable lid being integral with said downwardy domed conical projection, and said bottom wall being integral with said upwardly domed conical projection.

4,556,148

RACK FORMED OF A PLURALITY OF PROFILED BARS

Ernst Koller, Paradiesstrasse 64, CH-4102 Binningen, Switzerland

Filed Jan. 3, 1983, Ser. No. 455,313

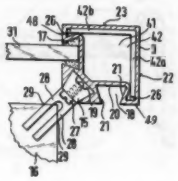
Claims priority, application Fed. Rep. of Germany, Jan. 8, 1982, 3200310

Int. Cl.[4] A47F *5/00*

U.S. Cl. 211—189 **14 Claims**

1. A rack formed from a plurality of profiled bars, comprising at least four vertically oriented hollow bars positioned for enclosing an internal area; each vertical bar having at least two longitudinal grooves defined in the periphery of the bar; the

grooves in each bar being spaced apart about the periphery of the bar about 45°; the grooves being adapted for clamping fast in them another structural element; the grooves being located around the periphery of the respective bars such that a first one of the at least two grooves of each bar are directed toward and opened opposite one of the two grooves of one of the two adjacent bars and the second of the two grooves of each bar are opened inwardly toward the interior area of the rack defined by the vertical bars; the hollow profiled bars being internally shaped for defining two narrow width internal grooves inside the bar with a third groove therein, the third groove being between the two internal grooves; a plug element having a plug-in section for each bar comprising an angled profile element with two legs, each of which legs is respectively received in one of the internal grooves; the ends of said bars at a junction are cooperatively shaped so that the coacting bar ends seat against each other for completely covering the inserted plug element for hiding the plug element.

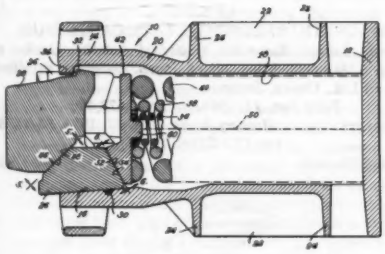


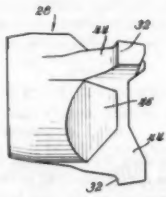
4,556,149

DRAFT GEAR

Richard A. Carlstedt, Wheaton, Ill., assignor to Miner Enterprises, Geneva, Ill.

Filed May 13, 1983, Ser. No. 494,428
Int. Cl.⁴ B61G *9/10, 11/14*
U.S. Cl. 213—34 **7 Claims**





1. In a friction draft gear having a housing with a closed end and an open opposite end on an axis therebetween, said open opposite end being provided with an inwardly tapered internal friction surface, wedge means mounted for axial movement in the open end of said housing and against which a draft force can be applied, friction means positioned within said housing between said wedge means and said friction surface and engageable with said wedge means and said friction surface to absorb the shock created by the application of a draft force to said wedge means, a follower member positioned adjacent said friction means, and resilient means positioned between the closed end of the housing and said follower member to cause said follower member to urge said friction means into engagement with said wedge means and said friction surface, the improvement comprising:

a. said friction means including a series of annularly spaced friction shoe means each having a beveled outer surface in engagement with a beveled inner surface of said wedge means, said beveled inner and outer surfaces being formed at a first selected angle with respect to the axis of said housing,

b. said shoe means each having a beveled inner face in engagement with a beveled outer face of said follower member to urge said shoe means into forceful frictional contact with said internal friction surface, said beveled inner and outer faces being formed at a second selected angle with respect to the axis of said housing,

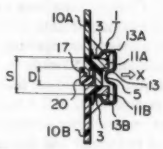
c. each said outer face being formed by recess means thereabout to form a respective raised pad, the surface area of each said inner face being at least equal to the surface area of the engaged raised pad and the surface area of the raised pad being sufficiently large such that during application of force to the draft gear each said inner face traverses substantially the entire surface of said respective raised pad and each raised pad traverses substantially the entire surface of the respective inner face to prevent accumulation of material at the interface of said inner and outer faces.

4,556,150

SPLIT-TYPE PLASTIC COVER WITH ELASTIC CLIPS

Yasumasa Ikumi, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Continuation of Ser. No. 341,855, Jan. 22, 1982, abandoned. This application May 14, 1984, Ser. No. 610,183
Claims priority, application Japan, Oct. 22, 1981, 56-167916
Int. Cl.⁴ B65D *45/18*
U.S. Cl. 220—4 B **7 Claims**



1. A plastic enclosure comprising a pair of convex cover halves, each having a periphery matable with the periphery of the other and at least one flanged projection adjacent to said periphery, each flanged projection on one of the cover halves being opposite a corresponding flanged projection on the other of the cover halves when the peripheries of the cover halves are mated together, and at least one fixture which holds the corresponding opposite flanged projections of the two cover halves when the two cover halves are mated to each other, said fixture comprising:

an elastic clip formed from a single strip of resilient material, the strip of resilient material having a center portion and two free ends which press the corresponding opposite flanged projections toward each other, the free ends being bent to extend transversely to the center portion, the bends of the free ends forming outer corners of the clip, and the center portion having a reverse bend forming a center recess having a bight extending in the same direction as the free ends such that the bight of the reverse bend is spaced inwardly from a line joining the outer corners of

the clip, thereby enabling the clip to be easily opened and elastically deformed for attachment to and detachment from the flanged projections, said bight being accomodated by the opposing flanged projections forming a gap therebetween inwardly of the outer boundaries of said flanged projections and outwardly from where the peripheries of the halves mate together.

4,556,151

METAL VESSEL HAVING CIRCUMFERENTIAL SIDE SEAM AND ADHESIVE PRIMER FOR USE IN PRODUCTION THEREOF

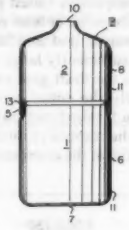
Kazuo Taira, Tokyo; Akihiko Morofuji; Seishichi Kobayashi, both of Yokohama, and Hiroshi Ueno, Yokosuka, all of Japan, assignors to Toyo Seikan Kaisha Ltd., Tokyo, Japan

Filed Oct. 21, 1983, Ser. No. 544,266

Claims priority, application Japan, Oct. 25, 1982, 57-186110; Oct. 28, 1982, 57-188140

Int. Cl.⁴ B65D *6/00, 8/00*

U.S. Cl. 220—67 **9 Claims**



1. A metal vessel comprising an upper member and a lower member, each consisting of a coated cup-shaped formed metal body and a circumferential side seam being formed by lap-bonding the open ends of the upper and lower members to each other through an adhesive, wherein each of said coated cup-shaped formed metal body is composed of a metal blank having a coating of a vinyl chloride resin having a vinyl chloride unit content of 30 to 97% by weight and a glass transition temperature of at least 40° C. and containing carboxyl groups and/or hydroxyl groups at a concentration of 10 to 500 millimoles/100 g of the resin, said adhesive comprising a copolyester containing in the main chain at least 50 mole %, based on the total acid component, of terephthalic acid, at least 50 mole %, based on the total alcohol component, of 1,4-butane-diol and at least 1 mole % of at least one member selected from other acids and other alcohols, and the upper and lower members are bonded to each other through said vinyl chloride resin coating and said copolyester type adhesive, the difference in the solubility parameter, Sp, between the coating resin and the copolyester adhesive being smaller than 1.0 $(cal/cc)^{\frac{1}{2}}$.

4,556,152

TEAR OPENING MEANS FOR CONTAINERS

Ingemar S. B. Bogren, Sigtuna, Sweden, assignor to Esselte Pac Aktiebolag, Jarfalla, Sweden

PCT No. PCT/SE84/00179, § 371 Date Jan. 7, 1985, § 102(e) Date Jan. 7, 1985, PCT Pub. No. WO84/04511, PCT Pub. Date Nov. 22, 1984

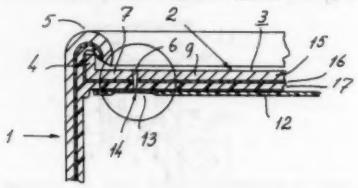
PCT Filed May 15, 1984, Ser. No. 694,827

Int. Cl.⁴ B65D *17/40*

U.S. Cl. 220—276 **7 Claims**

1. Opening means for containers, especially powder proof, liquid proof or gas proof containers of the type which at least at one end is closed by means of an end closure (2) providing an openable and panel which for intance by means of a sealing edge (4) is sealingly connected to the container, characterized in that the end closure is punched through along a line (6) of the end panel (3) extending some distance inside of the sealing edge (4),

in that the end panel (3) on the lower surface thereof carries a sealing foil (12) of a weldable or solderable material which is welded or soldered to the end panel (3) over a joining strip (13) so as to seal the through punching (6) of the end panel (3),



in that the end panel (3) is made of a material having a higher shearing strength than that of the material of the lower sealing foil (12),

and in that the end panel (3) is formed with means for forming an opening in the container by tearing open the end panel (3) and the sealing foil (12) along the through punching (6) of the end panel (3).

4,556,153

MAGNETIC RECORDING TAPE CARTRIDGE

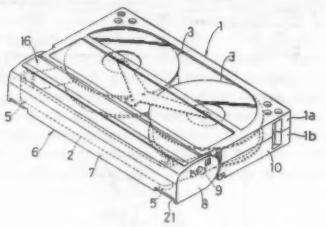
Hiroyoshi Takagi, Kameoka; Toshiyuki Amaike, Osaka, and Hikaru Mizutani, Mino, all of Japan, assignors to Hitachi Maxell Ltd., Osaka, Japan

Filed Jun. 22, 1984, Ser. No. 623,456

Claims priority, application Japan, Jun. 22, 1983, 58-112544

Int. Cl.⁴ G11B *23/10*

U.S. Cl. 220—334 **18 Claims**



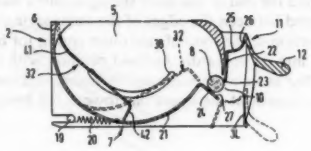
1. A magnetic recording tape cartridge comprising a case body, a recording tape accommodated in the case body, front lid means movably mounted on the case body, being operable to be opened and closed for covering the front surface of the recording tape drawn out of the case body upon closure of the front lid means, dust cover means movably mounted on the case body, being operable to be opened and closed for covering the rear surface of the recording tape drawn out of the case body upon closure of the dust cover means and lock means for keeping the dust cover means in the closed state.

4,556,154

CIGARETTE DISPENSER WITH ELECTRIC STARTER

Ladislav Bajtala, Haid, and Pavel Puskin, Traun, both of Austria, assignors to System-Finanz Anlagenberatungsgesellschaft m.b.H., Salzburg, Austria, by said Ladislav Bajtala

Filed Nov. 14, 1983, Ser. No. 551,386
Claims priority, application European Pat. Off., Nov. 15, 1982, 82110536.8
Int. Cl.[4] A24F *15/04, 15/10*
U.S. Cl. 221—147 9 Claims



1. A cigarette dispenser having an electric lighter including a hot bulb, a housing with a storage chamber for the cigarettes, and a dispenser opening on the front side of the housing, comprising in combination:

(a) a dispenser opening which is formed by a horizontal slot of a width and a length larger than the length and cross section of one cigarette;

(b) an up and down movable, upwardly spring-loaded dispenser drawer located in front of the dispenser opening and having a closing edge, said closing edge in the upper end position of the dispenser drawer closing off the dispenser opening to a cross section smaller than the longitudinal cross section of one cigarette, the dispenser drawer having an upper side on which is a cigarette-receiving surface, said cigarette-receiving surface having a catching edge, said dispenser drawer in its lower end position being located below the dispenser opening, said dispenser drawer having a handle on the front side thereof;

(c) a stop fixed on said housing directly above and on one side of the dispenser opening; and

(d) a recess between the cigarette-receiving surface and the stop, said recess having a larger cross section than the cross section of one cigarette;

(e) the hot bulb of the starter being located below the recess and forming a rest for a cigarette whose mouth-piece end projects upward out of the recess, the dispenser drawer being pivotable about a horizontal axis located in the rearward area of the housing on two lever arms which extend along the side walls of the housing, wherein at least one of the lever arms of the dispenser drawer is formed by a toggle lever having a further lever arm, a spring engaging the end of the further lever arm of the toggle lever for the spring loading of the dispenser drawer, the further lever arm being remote from the dispenser drawer, the spring having a free end secured on the housing.

4,556,155

ELEVATOR GOVERNOR

Werner Koppensteiner, Vienna, Austria, assignor to Otis Elevator Company, Farmington, Conn.

Filed Oct. 14, 1983, Ser. No. 542,304
Claims priority, application Austria, Apr. 13, 1983, 1321/83
Int. Cl.[4] B66B *5/04*
U.S. Cl. 187—38 3 Claims

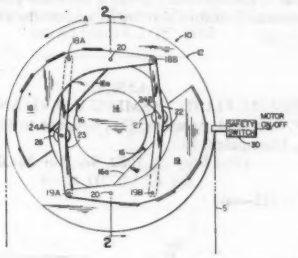
1. An elevator governor characterized by:

a stationary surface;

a disc that is rotatable by a rope around the stationary surface, the disc having at least one surface opposite the stationary surface that defines a wedged or tapered space between the stationary surface and the disc;

a pair of weights that are pivotally mounted on the disc and mechanically interconnected so that the weights pivot simultaneously in the same radial direction; and

a roller which is carried on the disc and located between the disc and the stationary surface and connected to the



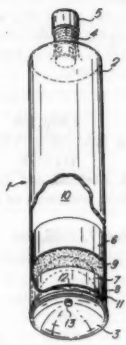
weights to be progressively moved into the tapered area as the weights pivot in a first direction in response to disc rotational speed, said roller mechanically connecting the disc and the stationary surface when the weights pivot to a first position.

4,556,156

PRESSURIZED DISPENSING APPARATUS

Bernard D. Frutin, Stewarton, Scotland, assignor to Rocep-Lusol Holdings Limited, Glasgow, Scotland

PCT No. PCT/GB82/00278, § 371 Date Jun. 1, 1983, § 102(e) Date Jun. 1, 1983, PCT Pub. No. WO83/01244, PCT Pub. Date Apr. 14, 1983
PCT Filed Sep. 24, 1982, Ser. No. 509,440
Claims priority, application United Kingdom, Oct. 6, 1981, 8130127; Apr. 24, 1982, 8211944
Int. Cl.[4] B67D *5/42*
U.S. Cl. 222—386.5 11 Claims



1. A dispenser for dispensing a product under pressure of a propellant, including a container, a piston slidable in the container and dividing same into a product chamber for product to be dispensed and a propellant chamber, a flowable sealant material engaging the container wall and slidable with the piston, closure means for retaining propellant within the propellant chamber and a product outlet extending from the product chamber characterised in that the flowable sealant material comprises a liquid substance providing a substantially impenetrable barrier to the propellant, the piston being a composite piston including a first wall-engaging surface and a second wall-engaging surface, the wall-engaging flowable sealant material being located between said surfaces, in which the

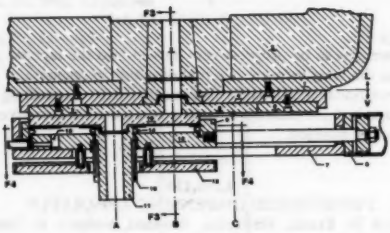
composite piston comprises a primary piston having a wall-engaging skirt, a separate independently slidable secondary piston having a wall-engaging skirt and between said primary and said secondary pistons a (deformable) flowable sealant material whereby under pressure said (deformable) flowable material is (compressed) pressed between (the) said primary and secondary pistons and urged against the container wall to form a seal.

4,556,157

PRESSURE FLUID TEEMING VALVE AND METHOD

Earl P. Shapland, Sarasota, Fla., assignor to Flo-Con Systems, Inc., Champaign, Ill.

Filed May 24, 1982, Ser. No. 381,063
Int. Cl.[4] B22D *41/08*
U.S. Cl. 222—600 **63 Claims**



1. A gate valve for a molten material containing vessel having a discharge orifice, comprising

a valve frame secured to the vessel;

valve plates, one stationary and one movable, having at least one teeming orifice each;

said lower movable plate having a depending collector nozzle;

means for positioning the valve plates within the frame for relative movement one to the other;

means for moving said movable valve plate;

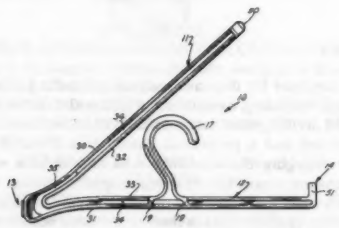
and means for applying a uniformly distributed force on the entire lower surface of said lower plate outside the depending collector nozzle.

4,556,158

PARALLEL BAR HANGER WITH COMPRESSION HINGE

Russell O. Blanchard, Zeeland, and John H. Batts, East Grand Rapids, both of Mich., assignors to John Thomas Batts, Inc., Zeeland, Mich.

Filed Mar. 7, 1985, Ser. No. 709,333
Int. Cl.[4] A41D *27/22*
U.S. Cl. 223—88 **15 Claims**



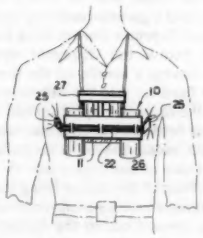
1. A one-piece molded plastic garment hanger having a body including upper and lower bars each of I-beam cross section and pivotally connected at one end, a support hook connected to the lower bar substantially midway between the ends of the bars, latch means at the other end of the bars for detachably securing the bars together in substantially parallel and vertically aligned relationship, the improvement in said hanger comprising: a hinge forming said connection between said bars at said one end, the parallel flanges of said bars at said hinge being spaced and detached forming inner and outer spring members each including a loop extending from the upper to the lower bar and the web connection between the flanges of the I-beam bars being eliminated throughout the length of the hinge, the outer spring member extending outwardly substantially beyond the end of the inner spring member and having a web centered between the edges of the outer spring and occupying a portion of the loop of said outer spring for biasing the upper bar into an upwardly inclined position with respect to the lower bar at an acute angle and stiffening said outer spring against movement of the upper bar toward the lower bar.

4,556,159

PROTECTIVE HOLDER FOR BINOCULARS

Dwight P. Swain, 420 Paso Robles Dr., Santa Barbara, Calif. 93108

Filed Nov. 26, 1984, Ser. No. 674,938
Int. Cl.[4] A45F *5/00*
U.S. Cl. 224—257 **7 Claims**



1. A holder device adapted to hold neckstrap-suspended binoculars or cameras in a non-swinging manner in front of the user comprising:

(a) an elongated elastomeric holding band having two extremities in opposed relationship with respect to the axis of elongation of said holding band,

(b) releasable fastener means associated with each extremity of said holding band, thereby facilitating formation of said holding band into a closed loop having a variably sized perimeter and portions which are forwardly and rearwardly disposed with respect to a horizontally disposed plane containing said axis of elongation,

(c) tensioning means associated with said holding band at a site that becomes the forwardly disposed portion of said closed loop, said tensioning means having two freely movable extremities adapted to apply a tensioning force directed substantially horizontally and rearwardly with respect to said closed loop,

(d) engaging means associated with each extremity of said tensioning means and adapted to releasably engage the apparel of the user, and

(e) lens protecting means attached by a flexible tether to said holding band.

4,556,160

ROLL HOLDER, PARTICULARLY FOR A ROLLED FLAT PRODUCT

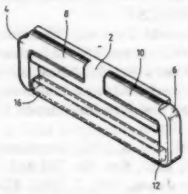
Josef Kurz, Haigerloch, and Andrea Stinglwagner, Bad Überkingen, both of Fed. Rep. of Germany, assignors to Kurz Kunststoffe GmbH, Haigerloch-Owingen, Fed. Rep. of Germany

Filed Mar. 14, 1984, Ser. No. 589,664

Claims priority, application Fed. Rep. of Germany, Apr. 26, 1983, 3314991

Int. Cl.[4] B65H *35/10*

U.S. Cl. 225—67 16 Claims



1. A roll holder, particularly for a roll of a flat product to be unrolled from the roll, comprising a base plate having an axis; a suspension yoke; and a braking yoke, each yoke being of U-shape cross-section and including a first arm extending in the direction of said axis of the base plate and pivotally supported thereon relative to said axis, and a second free arm, the free arm of said suspension yoke and the free arm of the braking yoke being positioned at an equal radial distance from said axis and overlapping each other, said suspension yoke and braking yoke having U-shaped lateral sides which are open in opposite directions.

4,556,161

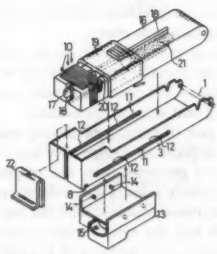
STAPLER AND STAPLES TO BE MOUNTED

Kunimasa Oide, Osaka, Japan, assignor to Daichiku Co., Ltd., Osaka, Japan

Filed Feb. 16, 1983, Ser. No. 467,029

Int. Cl.[4] B25C *5/02, 5/04, 5/06, 5/08*

U.S. Cl. 227—83 3 Claims



1. A stapler comprising a staple extruding member, a staple ejection slot, a staple holding member and a base plate having a staple bending member which are all combined into a single unit in a manner to be able to rotate by means of a pin, said stapler characterized in that:

a detachable spacer is fitted adjacent the staple ejection slot at the end of the staple magazine; and

a sliding piece that slides a distance between a first position adjacent said staple ejection and a second position closer to the pin fitted to the underside of the staple magazine, said sliding piece having a predetermined thickness and also a staple bending portion for covering only one side of the staple ejection slot when said sliding piece is in said first position.

4,556,162

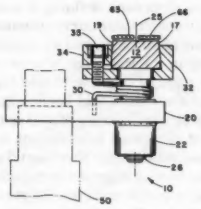
WELD BACKUP MECHANISM FOR INTERNAL PIPE WELDING APPARATUS

Richard B. Gwin, New Orleans, and Philip H. Manning, Mandeville, both of La., assignors to The Babcock & Wilcox Company, New Orleans, La.

Filed Apr. 17, 1984, Ser. No. 601,187

Int. Cl.[4] B23K *5/22, 9/02*

U.S. Cl. 228—50 9 Claims



1. An internal weld backup and pipe line-up clamp device for circumferential welding of cylindrical pipe, the device including a clamp having a plurality of clamping members disposed interiorly of the pipe, means for moving the clamping member in a radial direction to and from the inner surface of the pipe, and a plurality of weld backup ring segments each of which extends through an arc and terminates in termainl ends which are complemental to respective ends of adjacent segments, the improvement comprises support means for connecting at least one of the weld backup ring segments to one of the clamping members for movement therewith in the radial direction between a retracted position in which the ring segments are out of engagement with the inner surface of the pipe and an expanded position in which the ring segments engage the inner surface of the pipe, said ring segments being mounted to the support means and positioned with the terminal ends of adjacent ring segments in continuous sliding contact and adapted to be rotated about the respective radial axes of the respective ring segment arcs while being simultaneously moved in the radial direction, and wherein the major arcuate axes of the ring segments lie in a common plane when the ring segments are in the expanded position and the major arcuate axes of the ring segments extend at an angle to said common plane when the ring segments are out of the expanded position, and further comprising means for urging the ring segments to rotate about the respective axes so that the major arcuate axes of the ring segments lie in said common plane when the ring segments are in the expanded position.

4,556,163

METHOD FOR MANUFACTURING A JACK STAND

Philip L. Lundman, 419 Wheeler Ave., Fredonia, Wis. 53021

Continuation of Ser. No. 455,013, Jan. 3, 1983, abandoned. This application Jun. 24, 1985, Ser. No. 747,682

Int. Cl.[4] B23K *31/02*

U.S. Cl. 228—173.6 1 Claim

1. A method for manufacturing a jack stand of the type used in supporting a vehicle, the method comprising the steps of:

providing a rectangular sheet metal plate having opposited ends and opposite lateral edges,

stamping the rectangular sheet metal plate so as to form a pair of elongated parallel slots in the sheet metal plate extending from one of the opposite ends of the rectangular sheet metal plate toward the other of the opposite ends of the rectangular sheet metal plate, the elongated parallel slots being spaced apart from one another, and one of the elongated parallel slots being spaced from one of the lateral edges of the rectangular sheet metal plate by a distance substantially the same as the distance between the slots, and the other of the elongated parallel slots being

spaced from the other of the lateral edges of the rectangular sheet metal plate by a distance substantially the same as the distance between the slots, the slots defining three parallel planar legs, the legs each including a central longitudinal axis and having opposite ends, one of the opposite ends of said legs being integrally joined to a transverse body portion of the rectangular sheet metal plate defined by the other of said opposite ends of said sheet metal plate, said slots each having an end adjacent said transverse body portion of the rectangular sheet metal plate, said ends of said slots each defining a semicircular curve, one end of said semicircular curve terminating in a linear edge of a first one of said legs, and an opposite end of said curve terminating in a linear edge of a second one of said legs, said linear edge of said one of said legs being parallel too and spaced apart from said linear edge of said second one of said legs by the diameter of said semicircular curve, and so as to cut elongated indentations in each of the lateral edges of said rectangular sheet metal plate, said elongated indentations having opposite ends and extending from said one of said opposite ends of said rectangular sheet metal plate toward the other of said opposite ends of said rectangular sheet metal plate and terminating at said transverse portion, and each of said indentations terminating in an arcuate curve,

bending and connecting the edges of the rectangular sheet metal plate to form a cylinder such that the transverse body portion of the rectangular sheet metal plate forms a cylindrical body having a central longitudinal axis, and such that the indentations stamped in the lateral edges of

said rectangular sheet metal plate are in opposed relation and define a linear slot between a pair of said legs, said linear slot defined by said indentations terminating at said transverse body portion and a semicircular curve defined by said arcuate curves, one end of said semicircular curve terminating in a linear edge of one leg and an opposite end of said semicircular curve terminating in a linear edge of another of said legs, with said linear edges of said legs spaced apart by the diameter of said semicircular curve,

bending each of the legs about the central longitudinal axis of each such leg and such that each leg includes a first planar portion and a second planar portion joined by a bend portion extending along the length of each leg, the bend portion extending into a portion of the cylindrical body,

moving the other of the opposite ends of the legs radially outwardly away from the central longitudinal axis of the cylinder such that the legs will diverge outwardly away from one another and with the opposite ends of said legs forming ground engaging supports spaced apart from one another, and the first planar portion of one of the legs being substantially coplanar with a second planar portion of a second one of the legs,

fixedly connecting the other of the ends of the legs together in spaced apart relation, said step of fixedly connecting the legs together including the steps of inserting an elongated brace member between the ends of a pair of the legs, the elongated brace member including opposite ends, fixedly connecting one of the oppoiste ends of the brace member to a first planar portion of one of the legs, and fixedly connecting the other of the opposite ends of the brace member to a second planar portion of an end of another of the legs.

4,556,164

METHOD OF FIELD WELDING HEAD-HARDENED RAILS

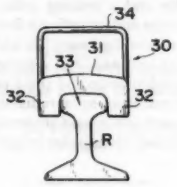
Hirotsugu Oishibashi; Katsuyoshi Ueyama; Muneyuki Ohara, all of Musashino; Mitsuo Nakamura, Higashikurume; Takeo Aichi, Kitakyushu, and Shigeru Sasaki, Niiza, all of Japan, assignors to Japanese National Railways; Hakusan Seisakusho Co., Ltd., both of Tokyo and Kyushu Tetsudo Kiki Seizo Co., Ltd., Fukuoka, all of, Japan

Division of Ser. No. 511,291, Jul. 6, 1983, abandoned. This application Feb. 19, 1985, Ser. No. 702,442

Claims priority, application Japan, Dec. 7, 1982, 57-214418

Int. Cl.[4] E01B *11/50*; B23K *11/04*

U.S. Cl. 228—199 **6 Claims**



1. A method of field welding head-hardened rails, comprising the steps of:

a. clamping and pressing together in abutting relation two rails to be welded together, with a portable welder device;

b. gas heating the two rails with the portable welder device where the two rails abut while pressed together by the portable welder device, so as to pressure weld the rails together to form a pressure welded portion of the two rails where the two rails abut;

c. punching excess metal formed on the pressure welded portion with the portable welder device so as to remove the excess metal on the pressure welded portion, immediately following said step of gas heating;

d. positioning a pair of metal jigs, having respective fitting portions each defined by a respective top contact portion and side contact portions, over the respective ones the two rails on opposite sides of the welded portion with the top contact portions in contact with the top surface of the respective rails and the side contact portions in contact with the respective side surfaces of the rail;

e. straddling the rails after said punching step with a truck of a heater device on a foot of the two rails;

f. after said straddling step and said positioning step, reciprocating a gas heater over the welded portion with a reciprocator attached to frames on the truck so as to heat treat the portion of the two rails, including the welded portion, between the pair of metal jigs; and

g. immediately after said reciprocating step, cooling the welded portion with an air blowing type cooler by disposing the cooler over the welded portion so as to have an injection portion of the cooler over the top surface of the welded portion and air jetting portions opposing the sides of the welded portion, blowing cooling air onto the top surface through the injection portion and jetting the air through the jetting portions.

4,556,165
METHOD OF BRAZING ALUMINUM EMPLOYING FLUOALUMINATE FLUX

Satoshi Yamawaki; Atsushi Sugihara; Yasushi Kobayashi; Hiroshi Ishida; Yukio Kuramasu, and Ichisei Gotoh, all of Shizuoka, Japan, assignors to Alcan International Limited, Montreal, Canada

Division of Ser. No. 494,372, May 13, 1983, Pat. No. 4,475,960, which is a continuation-in-part of Ser. No. 372,035, Apr. 26, 1982, abandoned. This application Jun. 20, 1984, Ser. No. 622,681

Claims priority, application Japan, Mar. 29, 1982, 57-49035

Int. Cl.[4] B23K *35/362*

U.S. Cl. 228—223 10 Claims

1. A method of producing a brazed joint between an aluminum or aluminum alloy component and another metallic component which comprises interposing between said components a body of a brazing alloy having a lower liquidus temperature than the solidus temperature of said components and a body of a flux consisting essentially of a mixture of fluoaluminate complexes containing Al, F, K, and Li atoms in said mixture, or a mixture of such complexes with aluminum fluoride, said flux having the Al, F, K, and Li atoms thereof present in amounts corresponding to the following proportions of the simple compounds:

aluminum fluoride about 53–62%

potassium fluoride about 35–44%

lithium fluoride about 2–7%

said flux containing up to about 2% entrained impurities, all percentages being by weight; and heating said assemblage to a temperature above the liquidus temperature of said brazing alloy and below the solidus temperature(s) of said components.

4,556,166
LIQUID-TIGHT CARDBOARD BARREL AND METHOD AND DEVICE FOR MANUFACTURING SAID BARREL

Pertti Penttilä, Hämeenpuisto 42 A 20, 33200 Tampere 20, Finland

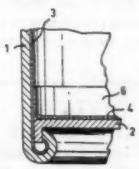
PCT No. PCT/F183/00014, § 371 Date Oct. 26, 1983, § 102(e) Date Oct. 26, 1983, PCT Pub. No. WO83/02929, PCT Pub. Date Sep. 1, 1983

PCT Filed Feb. 17, 1983, Ser. No. 557,155

Claims priority, application Finland, Feb. 26, 1982, 820692

Int. Cl.[4] B65D *5/40*

U.S. Cl. 229—3.1 8 Claims



1. A liquid-tight barrel comprising

an upstanding tubular wall having an open upper end and a lower end,

a bottom plate secured to the lower end of said wall to form a closed bottom end on said barrel,

first means for forming an impervious liquid barrier internally on the inner surfaces of said wall, and

second means for forming an impervious liquid barrier internally of the bottom end of said barrel, including an outer portion secured directly to said first means at the lower end of said wall to form a liquid-tight seal therewith and a flexible bottom portion closely overlying said bottom plate in unsecured relationship therewith to maintain said bottom portion and said seal substantially stress-free when said barrel is subjected to forces of deformation.

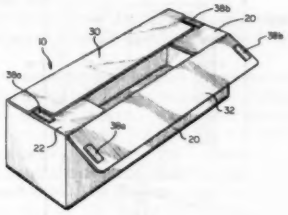
4,556,167
VELCRO FASTENING ARRANGEMENT FOR RECLOSEABLE CARTON FLAPS

James D. Fox, Homewood; Bruce C. Beckway, and Robert H. DeGroot, both of River Forest, all of Ill., assignors to Packing Materials Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 682,693, Dec. 19, 1984, abandoned. This application Mar. 18, 1985, Ser. No. 713,038

Int. Cl.[4] B65D *45/00*

U.S. Cl. 229—45 R 2 Claims



1. A carton for storing articles such as correspondence files and the like, the carton being normally sealed and closed to protect articles stored therein and being adapted to be periodically opened without damage to the carton and subsequently re-sealed to again close the carton, comprising:

a bottom wall and four side walls integrally formed to provide an open compartment for receiving therein said articles;

a pair of end flaps, each of which is integrally formed with an upper edge of one of said side walls which are opposed to one another and foldable along said upper edges to at least partially overlie the top of said open compartment;

a first and a second side flap each of which is integrally formed with an upper edge of one of said side walls which are opposed to one another and foldable along said upper edges to overlie said pair of end flaps when the latter are folded to overlie the top of said open compartment, said second side flap being proportioned to at least partially overlap said first side flap to seal and close the top of said open compartment;

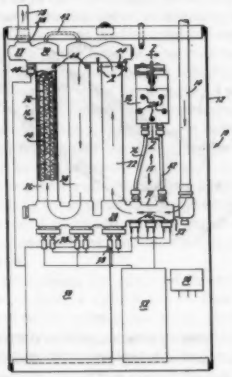
complimentary fastening means which are adapted to engage and disengage with one another fixedly secured to each of said end flaps and to at least one of said side flaps, said complimentary fastening means being affixed to each of said end flaps in a position where said complimentary fastening means normally would be overlapped by said first side flap when the latter is folded to overlie said end flaps and said first side flap being formed with portions thereof cut away such that said complimentary fastening means affixed to each of said end flaps is exposed when said first side flap is folded to overlie said end flaps, said complimentary fastening means being affixed to said second side flap in positions to engage with said complimentary fastening means affixed to said end flaps when said second side flap is folded to overlap said end flaps and said first side flap to thereby secure said end and side flaps together to seal the top of said open compartment, said complimentary fastening means being automatically disengaged with one another to permit said end and side flaps to be folded to open the top of said open compartment simply by exerting an upward force to said second side flap and subsequently automatically engaged with one another to close the top of said open compartment simply by exerting a downward force to said second side flap.

4,556,168

RAPID RESPONSE WATER HEATING AND DELIVERY SYSTEM

Peter Romanow, Novi, and Richard Andreasen, Northville, both of Mich., assignors to Star Manufacturing Company, Brighton, Mich.

Filed Feb. 6, 1984, Ser. No. 577,033
Int. Cl.[4] F22B *35/00*; G05D *23/00*
U.S. Cl. 236—25 A **21 Claims**



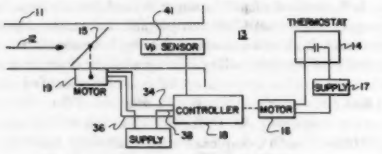
1. In a rapid response water heating and delivery system having a water inlet location, a water outlet location, a flow path along which water flows through the system between the water inlet location and the water outlet location, a heat exchanger assembly for delivering thermal energy to the water as it moves along the flow path, and an energizing system which powers the heat exchanger assembly, the improvement comprising means for generating a pressure differential between a first location along said flow path and a second location along said flow path and which varies in accordance with the rate of flow of water along said flow path, and a pressure differential sensor which senses said pressure differential and generates an output signal for activating said energizing system when the flow rate along said flow path reaches a predetermined threshold level, said pressure differential sensor including first and second pressure lines communicating with said first and second locations along said flow path and which are operative to transmit water from said first and second locations at pressures corresponding with those existing at said first and second locations, a housing formed with a high pressure chamber operatively connected with said first pressure line for receiving and holding water at a pressure corresponding to that existing at said first location and a low pressure chamber communicating with said high pressure chamber and operatively connected with said second pressure line for receiving and holding water at a pressure corresponding to that existing at said second location, a flexible diaphragm extending between said high and low pressure chambers which prevents water flow between said high and low pressure chambers and which is operative to move in the direction of said low pressure chamber when a pressure differential exists between said high and low pressure chambers, and a trigger means extending through said housing and which is operative to be moved by said diaphragm to generate said output signal by engaging an activating switch of said energizing system, said trigger means including a hollow sleeve carried within an aperture communicating between said low pressure chamber and the exterior of said housing, a follower having a follower surface within said low pressure chamber and an elongated pin extending through said aperture within said sleeve for engaging said activating switch, and a rigid disk disposed within said low pressure chamber between said diaphragm and said follower surface and operative to be moved by said diaphragm into engagement with said follower surface to effect movement of said follower surface within said low pressure chamber and movement of said pin into engagement with said activating switch.

4,556,169

ON-OFF THERMOSTAT BASED MODULATING AIR FLOW CONTROLLER

Daniel H. Zervos, Crestwood, Ill., assignor to Honeywell Inc., Minneapplis, Minn.

Filed Jun. 7, 1984, Ser. No. 618,280
Int. Cl.[4] F24F *13/10*
U.S. Cl. 236—49 **18 Claims**



14. A system for providing modulated air flow control in response to an on-off thermostat comprising:

an on-off thermostat;

a self-returning, slow moving motor connected to said thermostat for being driven in a first direction when said thermostat is closed and in a second direction when said thermostat is open;

a cam driven by said self-returning, slow moving motor for moving in a first direction when said motor moves in said first direction and for moving in a second direction when said self-returning, slow moving motor moves in said second direction;

a switch having a movable contact driven by a cam follower which moves in response to movement of said cam and first and second stationary contacts;

damper motor means connected to said first and second stationary contacts and to said movable contact for driving said damper in a first direction when said movable contact contacts said first stationary contact and for driving in a second direction when said movable contact contacts said second stationary contact, said damper motor means controlling said damper for modulating said air flow in response to said on-off thermostat; and,

air flow sensing means responsive to said air flow for providing a rebalancing force to said movable contact of said switch.

4,556,170

PNEUMATIC CONTROL SYSTEM

Franz Bender, Wendlingen; Klaus Blumensaat, Esslingen-Weil, and Wolfgang Bürthel, Waiblingen, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Jul. 16, 1984, Ser. No. 631,066
Claims priority, application Fed. Rep. of Germany, Jul. 21, 1983, 3326314
Int. Cl.[4] G05D *23/12*
U.S. Cl. 236—86 **4 Claims**

3. An apparatus for controlling a selected system within a vehicle having a fluid system for cooling an engine and a vacuum source having an outlet port, the apparatus comprising:

a first normally-open thermo-valve in thermal communication with a fluid in the fluid system and responsive to a selected threshold temperature of the fluid, the first thermo-valve having an inlet port and an outlet port,

a second normally-closed thermo-valve in thermal communication with the fluid in the fluid system and responsive

to the selected threshold temperature of the fluid, the second thermo-valve having an inlet port and an outlet port,

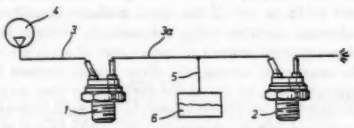
first means for coupling the outlet port of the vacuum source to the inlet port of the first thermo-valve,

second means for coupling the outlet port of the first thermo-valve to the inlet port of the second thermo-valve,

means for introducing ambient air to the outlet port of the second thermo-valve,

a normally-open actuator for controlling the selected system, the actuator having an inlet port, and

third means for coupling the second coupling means to the inlet port of the actuator,



whereby exposure of the first and second thermo-valves to fluid temperature in excess of the selected threshold temperature closes the first normally-open thermo-valve and opens the second normally-closed thermo-valve to connect the inlet port of the actuator to the atmosphere to cause the normally-open actuator to return to an initial position, and whereby exposure of the first and second thermo-valves to fluid temperature below the selected threshold temperature opens the first normally-open thermo-valve and closes the second normally-closed thermo-valve to cause the normally-open actuator to be displaced into a control position, thereby controlling the selected system.

4,556,171

HEATING SYSTEM FOR AUTOMOBILES WITH HEAT STORAGE TANK

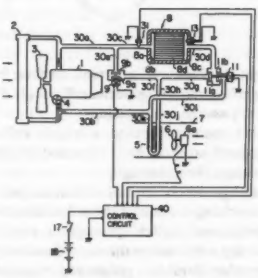
Akira Fukami, Okazaki, and Hiroki Noguchi, Oobu; Yauo Kondo, Okazaki, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Division of Ser. No. 296,252, Aug. 26, 1981. This application Mar. 17, 1982, Ser. No. 359,090

Claims priority, application Japan, Nov. 26, 1980, 55-166429; Nov. 26, 1980, 55-166430

Int. Cl.[4] **B60H** *1/02;* **F24D** *11/00;* **F01P** *11/02;* **F02N** *17/02*

U.S. Cl. 237—12.3 B **2 Claims**



1. A heating system for automobiles utilizing cooling water of an engine as a heat source, said engine having an inlet and an outlet for the cooling water, said heating system comprising:

a heating radiator associated with a fan and a motor to blow air through said heating radiator;

a heat accumulating water tank for storing hot cooling water and retaining heat thereof, said heat accumulating water tank having a mixing preventing device for preventing cold cooling water flowing into said heat accumulating water tank from mixing with the hot cooling water contained therein;

a first pipe line having an inlet and outlet pipe lines for connecting said heating radiator between the inlet and the outlet for the cooling water of the engine;

a second pipe line having an inlet and outlet pipe lines for connecting said heat accumulating water tank between the inlet and the outlet for the cooling water of the engine;

a third pipe line provided between said heating radiator and said heat accumulating water tank

a first valve to open and close the inlet pipe line of said first pipe line; and

a second valve to open and close the outlet pipe line of said second pipe line and to open and close said third pipe line; and

wherein by opening the inlet pipe line of said first pipe line by said first valve, and by opening the outlet pipe line of said second pipe line and closing said third pipe line by said second valve, said first pipe line and said second pipe line are both opened thereby to connect said heating radiator and said heat accumulating water tank in parallel with each other with respect to the engine, and

by closing the inlet pipe line of said first pipe line by said first valve, and by closing the outlet pipe line of said second pipe line and opening said third pipe line by said second valve, said heating radiator and said heat accumulating water tank are connected in series with each other with respect to the engine through the inlet pipe line of said second pipe line, said third pipe line and the outlet pipe line of said first pipe line,

said system further comprising,

an outflow temperature sensor positioned at an outlet of said heat accumulating water tank for sensing a temperature of the cooling water outflowing from said water tank,

an inflow temperature sensor positioned at an inlet of said heat accumulating water tank for sensing a temperature of the cooling water supplied from the engine to said water tank, and

a control circuit for controlling said first and second valves in response to signals from said outflow and inflow temperature sensors, such that

when said inflow temperature sensor senses a low temperature and said outflow temperature sensor senses a high temperature, said first and second valves are controlled to connect said heating radiator and said heat accumulating water tank in series between the inlet and outlet for the cooling water of the engine thereby to allow the cooling water of a low temperature to flow from the engine into said heat accumulating water tank to push out the hot water contained therein to flow into said heating radiator to radiate the heat and then to return to the engine, and

when said outflow temperature sensor senses a low temperature due to consumption of the hot water and replacement by cold cooling water from the engine, and when said inflow temperature sensor senses a high temperature due to warming up of the engine, said first and second valves are controlled to connect said heating radiator and said heat accumulating water tank in parallel with each other between the inlet and outlet of the cooling water of the engine.

2. A heating system of automobiles utilizing cooling water of an engine as a heat source, said engine having an inlet and an outlet for the cooling water, said heating system comprising:

a heating radiator associated with a fan and a motor to blow air through said heating radiator;

a heat accumulating water tank for storing hot cooling water and retaining heat thereof, said heat accumulating water tank having a mixing preventing device for preventing cold cooling water flowing into said heat accumulating water tank from mixing with the hot cooling water contained therein;

a first pipe line having an inlet and outlet pipe lines for

connecting said heating radiator between the inlet and the outlet for the cooling water of the engine;

a second pipe line having an inlet and outlet pipe lines for connecting said heat accumulating water tank between the inlet and the outlet for the cooling water of the engine;

a third pipe line provided between said heating radiator and said heat accumulating water tank

a first valve to open and close the inlet pipe line of said first pipe line; and

a second valve to open and close the outlet pipe line of said second pipe line and to open and close said third pipe line; and

wherein by opening the inlet pipe line of said first pipe line by said first valve, and by opening the outlet pipe line of said second pipe line and closing said third pipe line by said second valve, said first pipe line and said second pipe line are both opened thereby to connect said heating radiator and said heat accumulating water tank in parallel with each other with respect to the engine, and

by closing the inlet pipe line of said first pipe line by said first valve, and by closing the outlet pipe line of said second pipe line and opening said third pipe line by said second valve, said heating radiator and said heat accumulating water tank are connected in series with each other with respect to the engine through the inlet pipe line of said second pipe line, said third pipe line and the outlet pipe line of said first pipe line,

said system further comprising,

a control circuit for controlling said first and second valves, said control circuit having a timer to set a predetermined time length,

wherein said first and second valves are controlled to connect said heating radiator and said heat accumulating water tank in series between the inlet and the outlet for the cooling water of the engine from the start of the engine until the predetermined time length lapses and then connects said heating radiator and said heat accumulating water tank in parallel with each other between the inlet and outlet of the cooling water of the engine.

4,556,172

FLOW DIRECTION CONTROLLER

Norio Sugawara; Motoyuki Nawa, and Yutaka Takahashi, all of Nara, Japan, assignors to Matsushita Electric Industrial Co. Ltd., Osaka, Japan

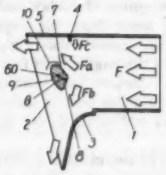
PCT No. PCT/JP83/00148, § 371 Date Jan. 25, 1984, § 102(e) Date Jan. 25, 1984, PCT Pub. No. WO83/04290, PCT Pub. Date Dec. 8, 1983

PCT Filed May 19, 1983, Ser. No. 576,393

Claims priority, application Japan, May 25, 1982, 57-89036; Aug. 24, 1982, 57-147121

Int. Cl.⁴ B05B *1/04*

U.S. Cl. 239—590.5 **6 Claims**



1. A flow direction controller having a plurality of operating modes including a split-flow mode, comprising:

means defining a blow out passage having first and second spaced-apart sides and having an interior region between said sides for conveying an air flow that is moving from upstream to downstream through said passage, said means including

a first flow-attaching wall provided at said first side of said passage, at least a portion of said flow-attaching wall being curved,

a biasing means provided on the second side of said passage for directing the flow toward said interior region, and

a substantially straight second flow-attaching wall disposed at said second side of said passage and downstream of said biasing means; and

a control blade that is mounted in the interior region of said blow out passage for rotation about an axis that extends perpendicular to said flow and substantially in parallel with said straight flow-attaching wall, said control blade being a columnar member having a substantially triangular cross-section with three angularly disposed surfaces, two surfaces out of the three surfaces constituting said columnar member being substantially straight and being disposed with respect to each other at an angle which is the maximum among the three angles formed between adjacent ones of the three surfaces so that said flow is divided into two components in the split-flow operation mode and said components are biased to attach to the first and second flow-attaching walls, the remaining surface of said control blade being curved so that a flow passing between it and said biasing means attaches to said remaining surface and being adapted to cooperate, in an operation mode other than said split-flow operation mode, with the upstream one of said two surfaces thereby to direct said flow in one direction.

4,556,173

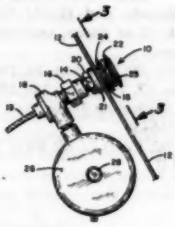
BIN FLUIDIZER

Josef Pausch, Minnetonka, and David A. Sorenson, Hopkins, both of Minn., assignors to General Resource Corp., Hopkins, Minn.

Filed Oct. 17, 1983, Ser. No. 542,643

Int. Cl.⁴ B05B *1/30*

U.S. Cl. 239—533.13 **4 Claims**



1. An apparatus attachable to a wall surface for directing a pressure wave of air radiating outwardly in all directions normal to a central passage, comprising

(a) a threaded member having a length sufficient to pass through a wall surface, said threaded member having a central passage therethrough;

(b) a raised flange on one end of said threaded member, said flange comprising a circular shoulder concentrically positioned about said central passage; a truncated conical section having a maximum diameter less than the diameter of said circular shoulder, projecting concentrically from said shoulder and terminating in a reduced diameter flat surface; at least two spacers projecting from said flat surface, and said central passage opening through said flat surface between said spacers;

(c) an end cap comprising a circular shoulder of substantially the same diameter as said flange shoulder; a truncated conical section having a maximum diameter less than the diameter of said shoulder, projecting concentrically from said shoulder and terminating in a flat surface; and holes

through said end cap alignable with said at least two spacers;

(d) means for removably fastening said end cap to said flange with said respective flat surfaces of said truncated conical sections in facing and spaced apart relationship, thereby forming an annular gap in the space between said conical sections, said gap being in air flow communication with said central passage; and

(e) a resilient O-ring seated against said respective truncated conical sections, said O-ring being sized for compressible fit about said conical sections to cover said facing portions and the spaced apart gap formed therebetween.

4,556,174

APPARATUS FOR TREATING DISPERSIONS AND THE LIKE WITH NON-SINUSOIDAL VIBRATION

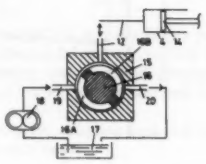
Helmut Sieke, Bingertstr. 10, D-6200 Wiesbaden, Fed. Rep. of Germany

Continuation of Ser. No. 273,770, Jun. 15, 1981, abandoned. This application Feb. 29, 1984, Ser. No. 583,491

Claims priority, application Fed. Rep. of Germany, Jun. 26, 1980, 3023886

Int. Cl.⁴ B02C *1/00, 19/16*

U.S. Cl. 241—1 **19 Claims**



1. Apparatus for treating material comprising a work member in contact with the material to be treated and means for vibrating said work member, said vibrating means comprising a hydraulic servomotor connected with said work member, hydraulic fluid supply means for connecting said servomotor alternately with a source of hydraulic fluid under pressure and with a return line in rapid succession to supply to said servomotor a rapid sequence of hydraulic impulses to impart to said work member non-sinusoidal vibration of selected frequencies and amplitude, and means for varying at least one of the acceleration, frequency and amplitude of said vibration during treatment of the material, said hydraulic fluid supply means comprising a rotary valve comprising a housing having a cylindrical bore and a cylindrical rotor rotatable and axially slidable in said bore, said housing having a first port connected with said source of hydraulic fluid under pressure, a second port connected with said return line and a third port connected with said servomotor, said cylindrical rotor having a first annular groove in position to communicate with said first port, a second annular groove spaced axially from said first annular groove and in position to communicate with said second port, a first series of circumferentially spaced branch grooves extending axially from said first annular groove, and a second series of circumferentially spaced branch grooves extending axially from said second annular groove toward said first annular groove and intercalated between said first branch grooves, said first and second branch grooves being in position to communicate alternately with said third port and thereby connect said servomotor alternately with said source of hydraulic fluid under pressure and said return line in rapid succession as said cylindrical rotor rotates.

4,556,175

GRANULATING AND COATING MACHINE

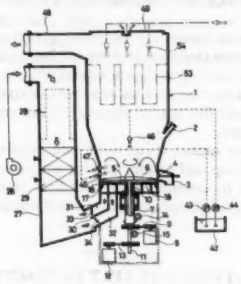
Shimesu Motoyama, Asaka; Kaora Kurita, Ranzan; Shizuka Sakashita, Chiba; Narimichi Takei; Sugito, and Shigeru Ohno, Kamakura, all of Japan, assignors to Freund Industrial Co., Ltd., Tokyo, Japan

Filed Sep. 23, 1983, Ser. No. 535,387

Claims priority, application Japan, Sep. 24, 1982, 57-167087; Nov. 22, 1982, 57-204836

Int. Cl.⁴ B02C *23/26*

U.S. Cl. 241—57 **13 Claims**



1. A granulating and coating machine for use in granulation, coating, mixing, drying and the like of materials, said machine comprising:

a casing for charging materials to be treated;

a rotator rotatable substantially horizontally in said casing;

at least one ventilating portion formed in said rotator;

an annular member on an inner of wall of said casing near the outer periphery of said rotator;

an annular slit for feeding slit gas into said casing formed between said annular member and the outer periphery of said rotator;

slit adjusting means for moving one of said rotator and said annular member to change the width of said slit by changing the distance between said annular member and the periphery of said rotator; and

a gas flow adjusting mechanism for controlling independently the rate of flow of the gas fed through said ventilating portion and the slit gas fed through said slit.

4,556,176

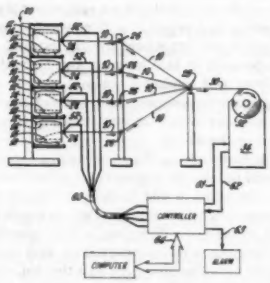
ROVING WINDER CONTROLLER

Gary M. Miller, Jackson, Tenn., assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Dec. 11, 1984, Ser. No. 680,383

Int. Cl.⁴ B65H *63/02, 54/02*

U.S. Cl. 242—38 **2 Claims**



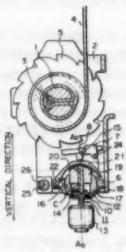
1. A controller for a roving winder comprising:

(a) a microprocessor for receiving input information, for processing said information, for producing a control signal in response to said input information and for communicating said input information and said output signal to a computer;
(b) a means to convert a plurality of signals from a plurality of strand detectors into input information as a first digital signal which can be processed by said microprocessor;
(c) a means to manually input a number as a second digital signal which can be processed by said microprocessor, said second digital signal being representative of the number of strands to be wound together into a roving by the winder;
(d) a program means for controlling said microprocessor, said program designed to compare by means of the microprocessor said first digital signal to said second digital signal and instruct said microprocessor to output a control signal if said first digital signal does not equal said second digital signal;
(e) an output means to convert said control signal into a means to stop said winder and for activating an alarm; and
(f) a means to communicate said first digital signal, said second digital signal and said control signal to a computer.

4,556,177
LOCK-TYPE SEAT BELT RETRACTOR OF AUTOMOBILE

Satosi Kuwakado, Aichi; Toshiaki Shimogawa; Teruhiko Koide, both of Okazaki; Shigeyasu Kanada, Inuyama, and Masahiro Iwatsuki, Kariya, all of Japan, assignors to Nippon Soken, Inc., Nishio and Kabushiki Kaisha Tokai Riki Denki Seisakusho, Niwa, both of, Japan

Filed Sep. 19, 1983, Ser. No. 533,811
Claims priority, application Japan, Sep. 24, 1982, 57-165116
Int. Cl.[4] A62B *35/02*; B65H *75/48*
U.S. Cl. 242—107.4 A **14 Claims**

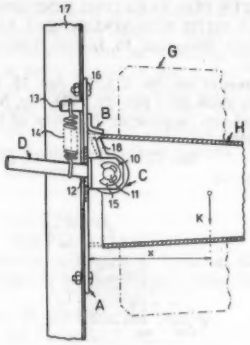


1. A lock-type seat belt retractor mounted on an automobile, comprising:
a housing for mounting on the automobile;
a ratchet mechanism including a reel rotatably supported in said housing and urged in a direction to retract and wind a seat belt, a ratchet wheel fixedly secured to said reel, a pawl supported in said housing and normally kept disengaged from said ratchet wheel;
a means for sensing shock, said sensing means having an inertia member which moves relative to said housing in response to the shock;
a means for transmitting the movement of said inertia member to said pawl; said transmitting means having a support member mounted in said housing so that, in operation, the support member does not displace as much as said inertia member in the same direction, a lever pivotably mounted in said housing, a rod supported by said support member so as to be movable along the axis thereof, said rod resting on said inertia member so as to move in response to the movement of said inertia member, the top end of said rod being in contact with said lever, so that, when said inertia member moves in response to the shock, displacement of said rod is transmitted to said lever, whereby said lever pushes up said pawl so as to engage with a tooth of said ratchet wheel;
said support member having a spherical outer surface which is in slidable contact with said housing, so that said support member is rotatable relative to said housing; and
said lever has a spherical inner surface which is concentric with said outer surface of said support member.

4,556,178
HOLDER FOR YARN PACKAGE

Hans S. Singer, Greenville, S.C., assignor to Hans S. Singer Co., Inc., Greenville, S.C.

Filed Jun. 11, 1984, Ser. No. 619,385
Int. Cl.[4] B65H *49/02*; D03J *5/08*
U.S. Cl. 242—130 **3 Claims**



1. A yarn package holder for carrying a yarn package having a yarn carrier with at least one outwardly extended annular lip including:
a mounting plate;
an outwardly extending wedging member finally carried by said plate;
a rotatable spring loaded wedging member opposite said first mentioned wedging member;
mounting brackets fixed to said mounting plate carrying said spring loaded wedging member enabling the insertion of a yarn package so that the lip of the yarn carrier is wedged between said wedging members; and
an outwardly extended portion of said mounting brackets providing an additional support for the yarn carrier.

4,556,179
AIRCRAFT LANDING GEAR

Jacques Veaux, Chatillon, and Michel Derrien, Versailles, both of France, assignors to Messier-Hispano-Bugatti (S.A.), Montrouge, France

Filed Dec. 8, 1983, Ser. No. 559,539
Claims priority, application France, Dec. 30, 1982, 82 22094
Int. Cl.[4] B64C *25/10*
U.S. Cl. 244—102 R **8 Claims**

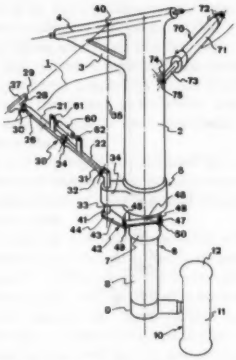
1. An aircraft landing gear of the type which is retractable between a so-called in position and a so-called out position, said landing gear comprising:
a strut having means for pivotably mounting said strut at one end to the structure of the aircraft;
said strut including a lower portion provided with a running gear and being pivotably mounted to said strut for rotation about a common axis;
a collapsible side brace comprising a lever;

said strut including a projecting end part in proximity to the lower portion of said strut;

a pivot pin rotatably mounted about its axis on said projecting end part for articulating said lever to said projecting end part;

a lug fixed to the strut lower portion in juxtaposition to said projecting end part;

a rod mounted to said projecting end part and being slidable with respect thereto;



an opening carried by said lug in the path of said rod for receiving the end of said rod to lock said lug relative to said projecting end part and prevent relative rotation therebetween when the landing gear is in its out position; and

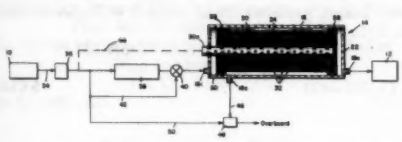
coupling means for coupling said rod to said lever of said collapsible side brace.

4,556,180

FUEL TANK INERTING SYSTEM

Scott A. Manatt, Granada Hills, Calif., assignor to The Garrett Corporation, Los Angeles, Calif.

Filed Dec. 7, 1978, Ser. No. 967,668
Int. Cl.[4] B64D *37/32*
U.S. Cl. 244—135 R **10 Claims**



1. A fuel tank inerting system for an enclosed volume in a helicopter having a turbine engine for producing bleed air, said system comprising:

separating means including tubular membranes having walls within a housing, inlet means for feeding air into a first end of said tubular membranes, first outlet means for passing gas from a second end of said tubular membranes, and second outlet means for passing gas passed through said tubular membrane walls;

means for feeding engine bleed air to said inlet means such that oxygen depleted gas is passed from said first outlet means and oxygen enriched gas is passed from said second outlet means;

means for feeding oxygen depleted gas from said first outlet means to said enclosed volume for preventing gas in said enclosed volume from attaining an oxygen concentration greater than about 9%;

jet pump means;

means for feeding engine bleed air to said jet pump for creating a low pressure stream exhausted overboard; and

means for connecting said jet pump low pressure stream to said second outlet means for exhausting said oxygen enriched gas overboard and maintaining a predetermined pressure differential across said tubular membrane walls.

4,556,181

FASTENER FOR ELECTRIC WIRES AROUND A PRINTED CIRCUIT BOARD

Toshinobu Nakamura, Tokyo, Japan, assignor to Shinagawa Shoko Co., Ltd., Tokyo, Japan

Filed Jan. 5, 1983, Ser. No. 455,833
Int. Cl.[4] F16L *3/08*
U.S. Cl. 248—74.1 **3 Claims**

1. In a wire fastener comprising the combination of a strip means for holding at least one wire and bendable thereabout according to a wire diameter and an attachment means for mounting said strip means to a panel, the improvement comprising:

said attachment means comprising a tongue integral with said strip means and insertable into an orifice of said board in order to temporarily mount and hold said fastener to said board in preparation for subsequent attachment to an underside of said panel by soldering said tongue to said panel, said strip means and attachment means being generally coplanar, said strip means providing a shoulder and said tongue having a dimple in order to provide temporary attachment of said fastener to said panel by sandwiching said panel between said shoulder and said dimple upon insertion of said tongue into said orifice and relative dimensions between said tongue and dimple and said orifice being sufficient to provide for a tight fit during insertion of said dimple in said orifice and for said sandwiching upon said insertion.

4,556,182

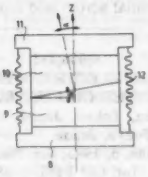
DEVICE FOR THE ORIENTATION AND THE POSITIONING OF A USEFUL LOAD

Richard H. Bentall, Voorhout, and Henry M. Briscoe, The Hague, both of Netherlands, assignors to Agence Spatiale Europeenne, Paris, France

PCT No. PCT/FR81/00086, § 371 Date Mar. 4, 1982, § 102(e) Date Mar. 4, 1982, PCT Pub. No. WO82/00218, PCT Pub. Date Jan. 21, 1982
PCT Filed Jul. 1, 1981, Ser. No. 359,715
Claims priority, application France, Jul. 4, 1980, 80 14959
Int. Cl.[4] F16M *13/00*
U.S. Cl. 248—179 **9 Claims**

1. A device for orienting and positioning a useful load comprising a base lieing in a first plane, a platform for supporting said useful load, a plurality of substantially cylindrical intermediate elements arranged in series between said base and said platform, respective coupling means coupling for relative rotation said base to an intermediate element located adjacent said base, adjacent intermediate elements to one another, and

said platform to an intermediate element located adjacent said platform, at least two adjacent intermediate elements having respective adjacent parallel faces inclined with respect to said first plane and coupled for relative rotation by said coupling means, wherein means are provided between said base and said



platform for preventing rotation of one of these with respect to the other, said means for preventing rotation being flexible in flexion and extension but rigid in torsion, and wherein means are provided for effecting relative rotation between said at least two intermediate elements.

4,556,183

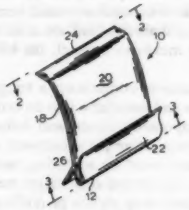
SHELF MOLDING CLIP

William Greenberger, White Plains, N.Y., assignor to The Hopp Press Inc., New York, N.Y.

Continuation of Ser. No. 336,842, Jan. 4, 1981. This application Mar. 5, 1985, Ser. No. 708,112

Int. Cl.⁴ E04G *5/06*

U.S. Cl. 248—221.4 **2 Claims**



1. An integral plastic clip assembly for securing a sign, marker or the like to a shelf molding comprising:

a generally flat J-shaped body defined by a first relatively long body portion and a second relatively short body portion, said second body portion and a first end portion of said first body portion defining a loop at a first end of said body for receiving and maintaining a sign with said loop being positioned to allow the line up of the sign to a shelf molding's top or bottom, said second body portion being formed as a continuous extension of said first end portion, said second body portion being arcuate in cross-section to facilitate bending of the clip into a pricing channel;

a first flange extending from a second end portion of said first body portion opposite said first end portion thereof, said flange extending from a first side of said first body portion opposite the side thereof defining a portion of said loop;

a second flange extending outwardly from said first side of said first body portion between said first flange and said loop, said first and second flanges defining first and second distal edges, respectively, which are substantially parallel to each other, said first and second flanges each forms an obtuse angle with said first side of said first body portion; and

said first body portion and said first and second flanges having sufficient resiliency to allow said flanges of said clip assembly to be snapped within a shelf molding.

4,556,184

EXTENDIBLE CEILING HOOK

Daniel J. O'Sullivan, 116-40 Park La. S., Kew Gardens, N.Y. 11418

Filed Aug. 8, 1983, Ser. No. 521,051

Int. Cl.⁴ A47H *1/10*

U.S. Cl. 248—330.1 **5 Claims**

1. An extendible ceiling hook, comprising an extension spool rotatable upon an axle mounted inside an assembly housing sealed with an assembly housing seal, the rotation of said extension spool being governed by a spring; an extension line secured to said extension spool and wound around said extension spool, exiting from said assembly housing at an opening and with an extension line grip secured thereto at a point outside said assembly housing; a notch and stop bar arrangement inside said assembly housing which permits said extension spool to rotate with speed but prevents said extension spool from rotation in a direction which would allow said extension line to unwind from said extension spool when the rotational speed of said extension spool is slow; a securing shaft protruding from said assembly housing.

4,556,185

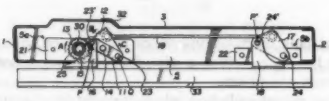
SEAT FRAME FOR A VEHICLE SEAT

Genziro Takagi, Akishima, Japan, assignor to Tachikawa Spring Co. Ltd., Japan

Filed Dec. 6, 1983, Ser. No. 558,531

Int. Cl.⁴ F16M *13/00*

U.S. Cl. 248—421 **5 Claims**



1. In a vehicle seat of the type including a seat frame, a pair of spaced slider rails to permit the vehicle seat to be reciprocally movable between forward and rearward positions and vertical adjustment means connecting said seat frame to said pair of slider rails for permitting said seat frame to be vertically adjustable relative to said slider rails, the improvement wherein said vertical adjustment means comprises:

right and left link mechanisms associated with a respective one of said pair of slide rails, each said right and left link mechanisms including,

(a) front and rear brackets vertically extending above and

rigidly fixed to said respective one of said pair of slide rails,

(b) a front link member pivotally connected at one end thereof to said front bracket by means of a first pivot shaft, and being pivotally connected at the other end thereof to an adjacent side portion of said seat frame by means of a second pivot shaft,

(c) a segment gear connected to said front link member by means of said second pivot shaft and also connected to said front link member by means of an intermediate pivot shaft such that said segment gear is coupled to said front link member so as to be immovable relative thereto, said first, intermediate and second pivot shafts being colinearly positioned along said front link member,

(d) a rear link member pivotally connected at one end thereof to said rear bracket by means of a third pivot shaft and pivotally connected at the other end thereof to said adjacent side portion of said seat frame by means of a fourth pivot shaft;

(e) link rod means pivotally connected to said segment gear and to said rear link member for responsively transferring pivotal movement of said segment member to said rear link member; and

(f) a center gear in meshed relationship with said segment gear, wherein said vertical adjustment means further comprises support shaft means for interconnecting said center gears of said right and left link mechanisms; and wherein said vertical adjustment means further comprises

support operation means connected to shaft means for selectively rotating said shaft means, and thus said center gears, in a first rotational direction, said center gears, in turn, responsively causing said segment gears to move and rotate the front link members in a second direction, opposite to said first direction, wherein movement of said segment gears responsively causes a force to be exerted at said second pivot shaft to cause said front link member to rotate in said second direction about said first pivot shaft by virtue of said immovable coupling between said front link member and said segment gear to responsively vertically displace said second pivot shaft, and thus said seat frame, relative to said first pivot shaft whereby said seat frame is vertically adjusted relative to said slide rails.

4,556,186

SEAT ADJUSTER

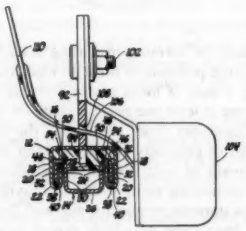
Otto J. Langmesser, Jr., Fraser; Charles R. Lock, Sterling Heights, and James C. Wood, Bloomfield Hills, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Aug. 15, 1983, Ser. No. 523,076

The portion of the term of this patent subsequent to Dec. 11, 2001, has been disclaimed.

Int. Cl.⁴ F16M *13/00*

U.S. Cl. 248—429 **4 Claims**



1. A seat adjuster comprising, in combination,

an elongated upper track member including a base wall and a pair of U-shape cross-section side portions, each such side portion including an outer side leg depending from one side of the base wall and joined by a bight portion to an inner side leg,

an elongated lower track member including a base wall and a pair of U-shape cross-section side portions, each including an inner side leg extending from one side of the base wall and joined by a bight portion to an outer side leg, the side portions of the upper and lower track members interfitting with each other,

upper runner means of low friction plastic material fitted between the free edges of the inner legs of the upper track member and the bight portions of the lower track member,

lower runner means of low friction plastic material fitted between the free edges of the outer legs of the lower track member and the bight portions of the upper track member,

shoe means of low friction plastic material fitted between the base wall of the upper track member and the bight portions of the lower track member to slidably support the upper track member on the lower track member,

latch means cooperatively engageable between the upper and lower track members to adjustably lock the track members in various positions relative to each other,

the base wall of the upper track member including openings therethrough, the shoe means including a groove below such openings,

and seat mounting brackets, each including hook shaped portions hooked to the base wall of the upper track member through the openings thereof and extending into the groove of the shoe means, said brackets being securable to a vehicle seat for mounting the seat to the upper track member, at least one of said brackets including means for mounting vehicle restraints thereto, with the loads resulting from such restraints resisted by the interfitting side portions.

4,556,187

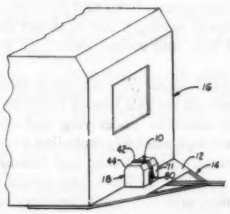
BATTERY BOX HOLD-DOWN

Marvin R. McLin, Wellston, Okla., assignor to Lynn McWhorter, Wellston, Okla.

Filed Jan. 4, 1984, Ser. No. 568,059

Int. Cl.⁴ A47B *97/00*

U.S. Cl. 248—503 **8 Claims**



1. A battery box hold-down for securing a battery box to a base, the device comprising:

a first metal strip with a shape congruous to one side of the battery box and comprising an inside surface, a first end attachable to the base and a second end;

a slip-joint hinge comprising two reversibly joinable components, a first component being attached near the second end of the first metal strip;

a second metal strip with a shape congruous to a top of the battery box, and comprising an inside surface, a first end having a second component of the slip-joint hinge attached nearby to facilitate the reversible engagement of the first metal strip with the second metal strip, and a second end;

a hasp attached near the second end of the second metal strip;

a third metal strip with a shape congruous to a second side of the battery box and comprising an inside surface, an out-

side surface, a first end and a second end attachable to the base; and

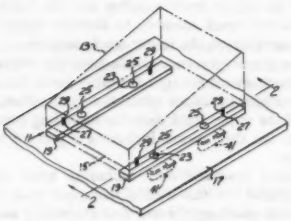
a hasp staple attached to the outside surface of the third metal strip near the first end thereof to facilitate a sliding engagement with the hasp.

4,556,188

SECURITY PLATFORM ASSEMBLY FOR COMPUTERS AND OTHER ELECTRICAL APPLIANCES

Irving Allison, Jr., 16884 Greenfield, Detroit, Mich. 48219

Filed Jan. 30, 1984, Ser. No. 575,076
Int. Cl.[4] F16M *13/00*
U.S. Cl. 248—553 **2 Claims**



1. In combination with a computer or other electrical appliance having a base mountable upon a support having an undersurface;

a security platform assembly for anchoring said computer to said support, comprising;

a platform bar bearing against said base;

said bar having a first pair of spaced apertures therethrough;

fasteners projecting up through said apertures and threaded into said base for securing said bar to said base;

said bar having at least one bolt aperture therethrough;

a bolt extending downwardly through the bolt aperture and through a corresponding bore through said support;

a fastener threaded onto said bolt in snug retaining registry with the undersurface of said support;

a detent plate spaced from said platform bar and underlying said support having a bolt aperture therethrough receiving said bolt, and spaced therefrom a cam retainer aperture;

one end of the detent plate including said cam retainer aperture being off set and spaced from the adjacent support;

and a lock assembly underlying and engaging said detent plate, said lock assembly including a body recessed on one side protectively enclosing said fastener;

and a key operated cylinder lock nested within and extending through said body including a rotatable cam projected through said cam retainer aperture retainingly engaging said detent plate for securing said lock assembly to said platform bar preventing access to said fastener.

4,556,189

CRT MONITOR TILT MECHANISM

Kenneth R. Kirpluk, Elmwood Park, and Kenneth F. Lewinski, Hoffman Estates, both of Ill., assignors to AT&T Teletype Corporation, Skokie, Ill.

Filed Feb. 6, 1984, Ser. No. 577,094
Int. Cl.[4] F16M *1/00*
U.S. Cl. 248—649 **4 Claims**

1. A mechanism for tilting a display screen of a CRT disposed within a cabinet having a top and a bottom joined by two sides, a back and a front having an opening to permit viewing of the display screen, the mechanism comprising:

means for supporting the front end of the cabinet on a substantially flat mounting surface;

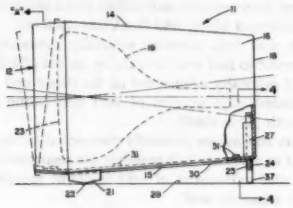
means for pivoting the cabinet about the support means;

means for supporting the back end of the cabinet at a selected height above the mounting surface including:

a foot slidably mounted on the back of the cabinet and arranged to move in a path substantially parallel to the vertical center line of the cabinet;

the foot having a first end adapted to contact the mounting surface;

means for urging the foot in the direction towards the bottom of the cabinet and into contact with the mounting surface, including an extension spring having one end



connected to the second end of the foot and having the other connected to the detent lever;

means for preventing the foot from moving in the direction towards the top of the cabinet including:

a ratchet rack having a plurality of teeth located on a surface of the foot;

a detent layer slidably mounted on the bottom of the cabinet, the lever having one end shaped as a pawl adapted to engage the ratchet rack; and

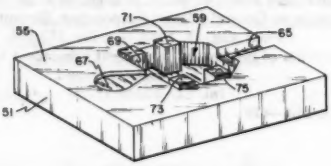
means for urging the pawl into engagement with the ratchet rack.

4,556,190

MOLD FOR GROMMET MOUNTED CONNECTOR

Gregory A. Smith, North Webster, Ind., assignor to Lyall Electric, Inc., Kendallville, Ind.

Filed Dec. 5, 1983, Ser. No. 558,179
Int. Cl.[4] B29C *6/04*
U.S. Cl. 249—99 **7 Claims**

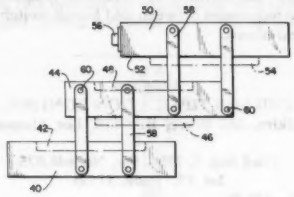


1. In a mold for forming insulating material about electrically conductive portions to form an electrical connector, the mold having a pair of mold cavity forming halves separable generally along at least one parting plane for removing formed electrical connectors from the mold, the improvement for forming a pair of generally parallel slots in opposed generally parallel sidewalls of such electrical connectors comprising a plurality of upstanding posts within the cavity halves immediately adjacent opposite connector sidewall forming cavity half sidewalls at least some of which extend beyond the parting plane and into the other cavity half when the halves are closed on one another, the posts of one cavity half directly contacting and overlapping the posts of the other mold half in an interleaved manner near the parting plane with the region of post overlap forming the connector slots.

4,556,191
MOLD FOR THE MANUFACTURE OF SHOE SOLES

Joseph V. Mangogna, 3316 Bendick, St. Louis, Mo. 63139

Filed Apr. 7, 1983, Ser. No. 482,718
Int. Cl.[4] B29C *1/00*
U.S. Cl. 249—119 2 Claims



1. A shoe mold comprising: a first mold means for providing a first mold cavity for a first shoe sole;

a second mold means for providing a cover for said first mold means and for providing a second mold cavity for a second shoe sole;

a third mold means for providing a cover for said second mold cavity;

said second mold means being cooperatively associated with said first mold means for closing against said first mold means; and

said third mold means being cooperatively associated with said second mold means for closing against said second mold means, wherein said second mold means is operatively secured to said first mold means for permitting latteral and vertical movement of said second mold means relative to said first mold means, said third mold means is operatively secured to said second mold means for permitting latteral and vertical movement of said third mold means relative to said second mold means independent of the movement of said second mold means relative to said first mold means and securing means such as to permit said mold means to occupy spaced apart positions with facing spaced sides substantially parallel.

4,556,192
BUTTERFLY VALVE WITH SERVO-MOTOR

Jan Ramisch, Fislisbach, Switzerland, assignor to BBC Brown, Boveri & Company Limited, Baden, Switzerland

Filed Sep. 6, 1984, Ser. No. 647,633
Claims priority, application Switzerland, Sep. 30, 1983, 5321/83
Int. Cl.[4] F16K *31/12*
U.S. Cl. 251—58 8 Claims

1. A butterfly valve assembly comprising:

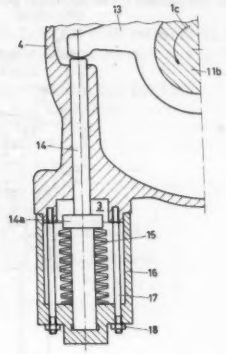
(a) a valve casing containing a passageway for a fluid;

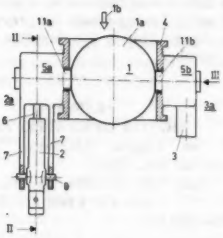
(b) a butterfly valve disposed in said passageway and mounted on a shaft which is pivotably mounted in said valve casing, said butterfly valve being pivotably movable between a first position in which it blocks or minimizes the flow of fluid through said passageway and a second, fully opened position in which it maximizes the flow of fluid through said passageway;

(c) a first spring continuously operatively connected to said shaft such that it continuously biases said butterfly valve towards its first position and such that it stores mechanical energy as said butterfly valve is pivoted towards its second position; and

(d) a second spring intermittently operatively connected to said shaft such that it intermittently biases said butterfly valve towards its first position when said butterfly valve is near its second position and such that it stores mechanical energy as said butterfly valve is pivoted towards its second position;

(e) wherein said second spring is located on an opposite side of the butterfly valve from said first spring and wherein a cam is mounted on said shaft, said cam compressing said





second spring as the butterfly valve moves toward its second position.

4,556,193
MOTOR-DRIVEN EXPANSION VALVE

Kenji Yoshiga, Funabashi, Japan, assignor to Fuji Koki Manufacturing Co., Ltd., Tokyo, Japan

Filed Sep. 26, 1984, Ser. No. 654,687
Claims priority, application Japan, Sep. 30, 1983, 58-151912[U]; Sep. 30, 1983, 58-151913[U]; Jan. 28, 1984, 59-10805[U]
Int. Cl.[4] F16K *31/02, 31/44*
U.S. Cl. 251—129.11 3 Claims

1. A motor-driven expansion valve comprising:

a valve casing having a first passage, a second passage, and a communication passage having a valve seat and permitting the first passage to communicate with the second passage;

a valve member provided within the valve casing and movable toward and away from the valve seat;

urging means for urging the valve member away from the valve seat;

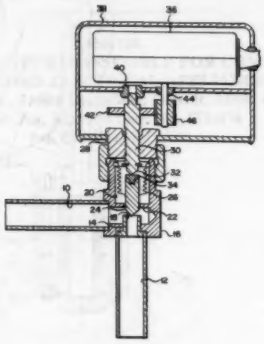
a drive screw disposed substantially in alignment with the valve member and threaded into the valve casing such that upon rotational movement said drive screw is moved in the same direction as the valve member to cause the valve member to be moved toward and away from the valve seat, said drive screw having a polygonal cross-sectional portion;

a motor having an output shaft;

a drive gear fixed to and concentric with said output shaft of said motor;

a driven gear which is concentrically mounted on said drive screw, said driven gear having a hole of a polygonal cross-sectional configuration through which the polygo-

nal cross-sectional portion of said drive screw is inserted to transmit rotational force from said output shaft of said motor to said drive screw, and being slidable relative to the polygonal cross-sectional portion of said drive screw



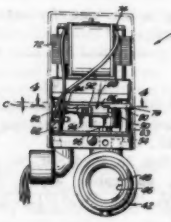
in the direction of movement of said valve member; said valve casing having means for preventing the movement of the driven gear in the direction of movement of the valve member.

4,556,194

MOTOR OPERATED VALVE

H. Peter van Lingen, Marlboro, Mass., assignor to Asahi/America Inc., Mass.

Filed Nov. 11, 1984, Ser. No. 671,485
Int. Cl.[4] F16K *31/04*
U.S. Cl. 251—129.12 **8 Claims**



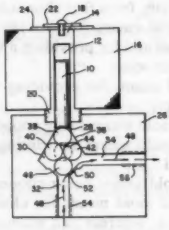
1. An electrically operated thermoplastic valve comprising:
valve housing means having a fluid flow passage extending therethrough for accomodating the flow of fluid;
restriction means rotatably mounted in said valve housing means for selectively blocking the fluid flow passage, said restriction means including a stem extending through said valve housing means;
cam means rigidly mounted to said stem for rotating with said restriction means;
motor means in communication with said retriction means and operative to rotate said restriction means and said cam;
a limit switch plate fixedly and non-rotatably mounted to said valve at a plurality of locations, said limit switch plate including a reduced thickness portion defined by a pair of parallel planar side walls and a planar base wall extending perpendicular thereto; and
a limit switch means fixedly and non-rotatably mounted to said valve and to said limit switch plate at a plurality of locations for selectively stopping the operation of said motor means, said limit switch means including a pair of perpendicularly aligned adjacent walls disposed in face-to-face contact with the base wall and one of said side walls of the reduced thickness portion of said limit switch plate, said limit switch means further including a cam follower in communication with said cam means and movable relative thereto, whereby movement of said cam follower relative to said cam means causes said limit switch means to stop operation of said motor means, and whereby the plurality of mounting locations prevents relative movement between said limmit switch means and said cam means.

4,556,195

FORCE AND MULTIPLICATION CONTROL VALVE

Noel C. Calkins, 352 Bryce, Box 416, Los Alamos, N. Mex. 87544

Filed Sep. 7, 1984, Ser. No. 648,075
Int. Cl.[4] F16K *31/06*
U.S. Cl. 251—129.20 **26 Claims**



1. A valve for controlling the pressure and flow of a fluid comprising:
armature means for producing and transferring an actuation force;
valve seat means for forming a valve seat in a flow orifice of said valve;
valve sphere means for forming a seal with said valve seat means;
ramp sphere means disposed between said armature means and said valve sphere means and arranged to form a central opening to centrally align said armature means and said ramp sphere means to uniformly and evenly transfer said actuation force from said armature means through said ramp sphere means to said valve sphere means;
conical ramp means for controlling movement of said ramp sphere means along a surface which forms a predetermined angle with the direction of said actuation force to reduce the axial distance of movement of said valve sphere means and produce a substantially uniform and even sealing force between said valve sphere means and said valve seat means which is proportionally larger than said actuation force by a factor equal to the quotient of the axial distance of movement of said armature means divided by the axial distance of movement of said valve sphere means.

4,556,196

METHOD AND APPARATUS FOR SEALING VALVE STEMS

Spencer M. Nimberger, Houston, Tex., assignor to General Screw Products Company, Houston, Tex.

Filed Dec. 21, 1983, Ser. No. 563,961
Int. Cl.[4] F16K *31/44*; F16J *15/34*
U.S. Cl. 251—214 **20 Claims**

1. A valve including a valve body having a fluid inlet and a fluid outlet, a valve seat, a valve stem having a central axis movable with respect to said valve body, and a sealing surface movable with said valve stem for sealing engagement with said valve seat, the improvement comprising:

an annular lip seal positioned between said valve body and said stem, said lip seal having an inner lip for sealing engagement with said stem, an outer lip for sealing engagement with said valve body, and an annular spacing between said lips for receiving fluid pressure from with said valve body to urge said lips into sealing engagement with stem and valve body;

a metallic ring member for engagement with lip ends of both said inner lip and said outer lip of said lip seal; and

biasing means positioned between said ring member and said sealing surface for applying a force to said ring member substantially directed along said valve stem axis and for biasing said lip end of said outer lip radially outwardly into sealing engagement with said valve body and biasing said lip end of said inner lip radially inwardly into sealing engagement with said stem.

4,556,197

BALL VALVE ASSEMBLY WITH EXPANDABLE VALVE ELEMENT

Peter G. Kindersley, Glens Falls, N.Y., and Matti O. Pyysalo, Helsinki, Finland, assignors to Neles Inc., Glens Falls, N.Y.

Filed Apr. 27, 1984, Ser. No. 604,682
Int. Cl.[4] F16K *5/20*
U.S. Cl. 251—315 **1 Claim**

1. A ball valve assembly comprising a housing having an upstream inlet and a downstream outlet in axial alignment with said inlet, said outlet having valve seating means surrounding said outlet, a ball valve element disposed in said housing and having a spherical surface, a first axis, a through bore surrounding said axis, said through bore terminating at each end thereof in openings, the improvement comprising said ball valve element having means for releasably receiving a member for turning said ball valve element about a second axis that extends substantially perpendicular to said first axis,

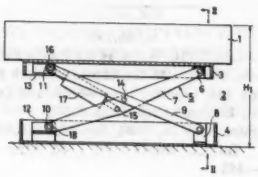
said ball valve element having exterior dimensions such that said ball valve element is movable in said housing towards said seating means without any substantial rotation of said ball valve element, said ball valve element having a portion thereof removed, said removed portion extending substantially parallel to said first axis whereby when said ball valve element is subjected to heat, said ball will expand with its surface becoming nonspherical and will exert pressure on said seating means.

4,556,198

HEIGHT ADJUSTING LIFTER FOR HOSPITAL BED

Hiroshi Tominaga, Kanagawa, Japan, assignor to Fuji Electric Co., Ltd., Kanagawa, Japan

Filed Dec. 19, 1983, Ser. No. 562,882
Int. Cl.[4] B66F *3/22*
U.S. Cl. 254—122 **4 Claims**



1. In a lifter for supporting and raising and lowering a hospital bed, comprising an upper frame supporting a bottom of said bed; a lower frame disposed on the floor; a link mechanism extending between said upper and lower frames and vertically expandable and collapsible when actuated and released, respectively; and actuating and releasing means for actuating and releasing said link mechanism, the improvement wherein said link mechanism comprises: a first pair of right and left link arms each having one end fixed at and rotatably borne on one of said upper and lower frames and another free end carried longitudinally movably on the other of said upper and lower frames; a second pair of right and left link arms sidewise intersecting said right and left link arms of said first pair, respectively, and each having one end fixed at and rotatably borne on said other frame and another free end carried longitudinally movably on said one frame; first bearing means for rotatably bearing fixed ends of said right and left link arms of said first pair; second bearing means for rotatably bearing said fixed ends of said right and left link arms of said second pair; first carrying means for carrying said free ends of said right and left link arms of said first pair; and second carrying means for carrying said free ends of said right and left link arms of said second pair, said first and second bearing means and said first and second carrying means being mounted on said fixed and free ends of said right and left link arms of said first and second pairs and on said upper and lower frames such that said right and left link arms of said first pair are positioned transversely inside of those of said second pair, whereby said right and left link arms of said first and second pairs as well as said first and second bearing means and said first and second carrying means are prevented from overlying one another when said link mechanism is lowered to bring said bed into a lowermost position, wherein said actuating and releasing means includes a hydraulic cylinder having a movable arm end connected to said right and left link arms of said first pair at a position offset from a pivot point of said link mechanism and a base end connected to a rod connecting said free ends of said right and left link arms of said second pair, and hydraulically extendible and contractable for vertically moving said right and left link arms of said first and second pairs relative to each other, and wherein said first bearing means comprises a first pair of right and left bearings mounted in transverse alignment on a bottom of said upper frame, wherein said second bearing means comprises a second pair of right and left bearings mounted in transverse alignment on a bottom of said lower frame, wherein said first carrying means comprise a first pair of right and left guide rails mounted in transverse alignment on said bottom of said lower frame; a first pair of right and left guide rails mounted in transverse alignment on said bottom of said lower frame; a first pin extending through said free ends of said right and left link

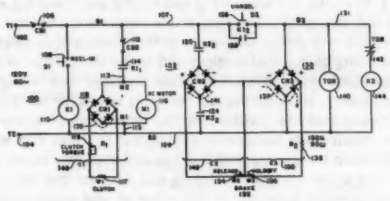
arms of said first pair; and a first pair of right and left rollers mounted rotatably on right and left ends of said first pin and guided in said right and left guide rails of said first pair, and wherein said second carrying means comprises: a second pair of right and left guide rails mounted in transverse alignment on said bottom of said upper frame; and a second pair of right and left rollers mounted rotatably on right and left ends of said rod and guided in said right and left guide rails of said second pair, said base end of said hydraulic cylinder being mounted to said rod at a location between said second pair of right and left rollers, and substantially equidistant to said right and left guide rails of said second pair of guide rails.

4,556,199

ELECTRIC WINCH APPARATUS

Ryan F. Dansie, 353 S. 1000E., Kaysville, Utah 84307; Wendell Holmes, Box 104, Liberty, Utah 84310, and Denzil B. Baird, 76 S. 300W., Brigham City, Utah 84302

Filed May 16, 1984, Ser. No. 610,899
Int. Cl.[4] B66D *5/30, 1/46, 1/12*
U.S. Cl. 254—348 **10 Claims**



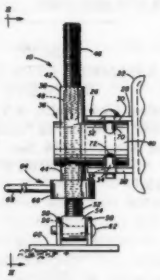
1. Winch apparatus comprising:
a drum and cable member having a motor (M1) with electrically energizable windings, a clutch with an electrically energizable engagement winding (W1) and a brake with an electrically energizable release winding (W2) and an electrically energizable hold off winding (W3);
a source of alternating current energy including first and second supply terminals (T1,T2);
a first bus conductor (B1) connected with said first supply terminal;
a second bus connector (B2) connected with said second supply terminal;
a first manually closeable spring return switch member (S1) and a first contactor coil (K1) electrically connected in series therewith, said series connected switch and coil being connected across said first and second bus conductors;
a first electrical rectifier (CR1) having alternating current terminals connected in parallel with said motor windings at a pair of electrical nodes (N1,N2) and direct current output terminals connected with said clutch engagement winding, one of said electrical nodes being connected with said second bus conductor;
first electrical contact means including a pair of electrically isolated normally open contact pairs ($K1_1$,$K1_2$) closeable by energization of said first contactor coil, a first of said contact pairs being connected between said first bus conductor and the second of said electrical nodes;
a second electrical rectifier (CR2) having a pair of alternating current terminals and a pair of direct current terminals (+ −), the direct current terminals being connected with said brake release winding;
second electrical contact means including a pair of electrically isolated normally open contact pairs ($K2_1$,$K2_2$) closeable by energization of a second contactor coil at a pair of terminals thereof, a first of said contact pairs being connected between said first bus conductor an one of said second rectifier alternating current terminals, the second of said contact pairs being connected between said second bus conductor and the remaining one of said second rectifier alternating current terminals, one of said second contactor coil terminals being connected to said bus;
a third bus conductor (B3) selectably connectable with said second bus conductor;
a second manually closeable spring return switch member (S2) electrically connected between said first and third bus conductors, and electrically shunted by the second of said first contact means contact pairs ($K1_2$);
a third electrical rectifier (CR3) having a pair of alternating current terminals and a pair of direct current terminals, the direct current terminals being connected with said brake hold off winding;
an electrical resistance member (R2) of predetermined electrical resistance connected in series with said third rectifier direct current terminals and said brake hold off winding;
time delay means (TDR) having a pair of actuating terminals connected with said second and third bus conductors and a normally closed contact pair which opens after a delay time, said contact pair being series electrically connected between said third bus and the second terminal of said second contactor coil.

4,556,200

RE-RAILING JACK

Leon H. Shoemaker, Russell, Ky., assignor to National Mine Service Company, Pittsburgh, Pa.

Filed Sep. 6, 1983, Ser. No. 529,692
Int. Cl.[4] B66F *9/04*
U.S. Cl. 254—424 **12 Claims**

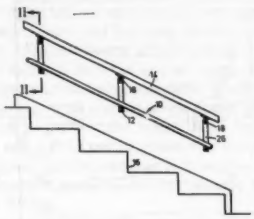


1. A lifting jack comprising,
a jack housing,
said jack housing having an internally threaded portion and a support portion integral with said housing,
a receiver fixedly positioned to receiver said jack housing support portion,
means for removably connecting said jack housing support portion to said receiver to permit pivotal movement of said jack housing support portion relative to said receiver,
said means for removably connecting said jack housing support portion to said receiver includes transverse slotted means in said support portion,
a connecting pin carried by said receiver and extending through said transverse slotted means such that said pin connects said support portion to said receiver while permitting angular removement of said support portion in said receiver relative to said pin,
a threaded jack screw threadedly positioned in said jack housing internally threaded portion,
a swivel base for supporting said threaded jack screw, and
means for turning said threaded jack screw in a selected direction to raise and lower said jack housing while permitting pivotal movement of said jack housing support.

4,556,201
HANDRAIL FOR TODDLERS

Robert M. Turner, 440 McMurchy Ave. South, Apt. #203, Brampton, Ontario, Canada (L6Y 2N5)

Filed Oct. 16, 1984, Ser. No. 661,429
Int. Cl.[4] E04H *17/14*
U.S. Cl. 256—59 20 Claims

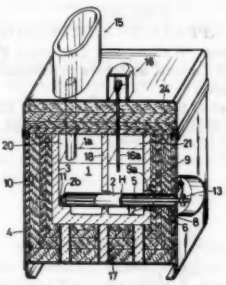


1. A handrail assembly comprising a handrail member, support brackets connectable to said handrail member at one end for supporting said handrail member at a short uniform distance from an adjacent wall, at least two elongate hanging devices for mounting said handrail member below another handrail, said devices being adapted to be mounted at one end to said adjacent wall at the same location as said other handrail and each connectable at the other end to one of said support brackets, and means for connecting said other end of each hanging device to one of said support brackets.

4,556,202
UNDER-HEATER TYPE FURNACE

Hitoo Yamura, Togane; Kakuro Ikeda, Tokyo, and Yuhichi Sakai, Togane, all of Japan, assignors to Toshiba Ceramics Co., Ltd., Tokyo, Japan

Filed Feb. 28, 1984, Ser. No. 584,348
Claims priority, application Japan, Mar. 4, 1983, 58-34410; Nov. 14, 1983, 58-212448
Int. Cl.[4] F27B *14/02*
U.S. Cl. 266—242 12 Claims

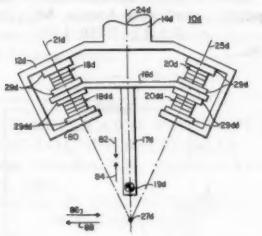


1. An under-heater type furnace for maintaining a molten metal at high temperature, comprising:
a refractory vessel made of a castable material and having a furnace chamber for containing the molten metal;
a heat insulating layer of a ceramic fiber material covering the exterior of the refractory vessel;
a heater;
a protective tube, located within said furnace chamber, made of ceramic and having a closed end and an open end for housing the heater and protecting the heater from the molten metal in the refractory vessel;
first and second supports for the protective tube located within said furnace chamber, on opposite sides thereof;
said first support comprising a tapered opening in a side wall of said refractory vessel which widens outwardly toward the exterior of said refractory vessel and which has tapered threads;
a sealing material disposed within the tapered wall opening, surrounding the protective tube for fixing the protective tube relative to the vessel;
said second support supporting the closed end of the protective tube in such a manner that the closed end of the protective tube can freely move relative to the second support.

4,556,203
REMOTE CENTER COMPLIANCE DEVICE

Jonathan M. Rourke, Cambridge, and Daniel E. Whitney, Arlington, both of Mass., assignors to The Charles Stark Draper Laboratory, Inc., Cambridge, Mass.

Filed Jan. 5, 1984, Ser. No. 568,357
Int. Cl.[4] F16F *3/08*
U.S. Cl. 267—141.1 15 Claims



1. A remote center compliance device comprising:
a first support member;
a second support member spaced from said first support member;
a first set of at least three shear pad flexure means interconnecting said support members and disposed along conical radii from a first center;
an operator member extending from said first support member; and
means for prestressing said flexure means into compression.

4,556,204
FIBER REINFORCED RESIN LEAF SPRING

Fred R. Pflederer, Milwaukee, Wis., assignor to A. O. Smith Corp., Milwaukee, Wis.

Filed Aug. 24, 1984, Ser. No. 643,708
Int. Cl.[4] F16F *1/18*
U.S. Cl. 267—148 6 Claims

1. A fiber reinforced resin leaf spring construction comprising, a curved central section and a pair of generally circular end sections connected to the respective ends of the central section, each end section defining an opening, said spring comprising an endless strand of substantially continuous fibers impregnated with a cured thermosetting resin, said strand disposed in an upper run and a lower run in said central section and said strand extending through said end sections to connect

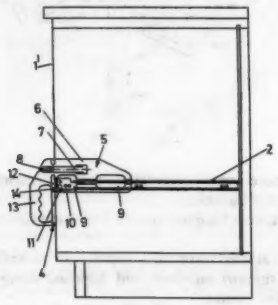
said upper and lower runs, said upper and lower runs being bonded together flatwise at a neutral axis, the portion of said strand joining each run and the respective end section constituting a neck region, and a plurality of longitudinally extending ribs disposed in said neck region, said ribs extending alternately upwardly and downwardly from a plane passing through said neutral axis, said ribs increasing the stiffness of the spring in the neck region to prevent delamination along said neutral axis.

4,556,205

GAUGING TOOL

Erich Röck, and Josef Brunner, both of Höchst, Austria, assignors to Julius Blum Gesellschaft m.b.H., Höchst, Austria

Filed Mar. 10, 1983, Ser. No. 474,037
Claims priority, application Austria, Mar. 24, 1982, 1144/82
Int. Cl.[4] B25B *3/00*
U.S. Cl. 269—2 **5 Claims**



1. A gauging tool for use in mounting generally U-shaped rails of a drawer assembly onto walls of an article of furniture which is to receive a drawer of the assembly, said gauging tool comprising:

a gauging plate having a surface for abutting a front face of a furniture wall;

a holding member integral with said gauging plate and extending normally therefrom in a direction to extend along an inner surface of the furniture well when said surface of said guaging plate abuts the front face of the furniture wall;

said holding member having on opposite lateral sides thereof separate supporting means for supporting a rail to be mounted on the inner surface of the furniture wall, so that said tool may be employed alternately to mount rails on either left side or right side walls of the article of furniture, each said supporting means comprising a pair of vertically spaced grooves adapted to receive flanges of a U-shaped rail and a flange between said grooves for extending between the flanges of the U-shaped rails;

said holding member having therein at least one laterally extending aperture, in the area of said supporting means, such that the rail may be attached to the furniture wall through said aperture; and

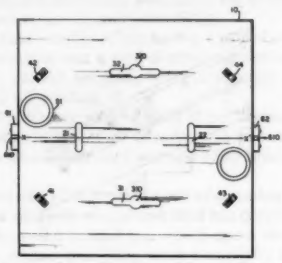
said holding member having at least one stop means for abutting with a rail supported by said supporting means and thereby for positioning the thus supported rail in the direction of the depth of the furniture wall.

4,556,206

SPLICE WORK TRAY ASSEMBLY

John J. Anderton, Oil City, Pa., assignor to GTE Products Corporation, Stamford, Conn.

Filed Nov. 3, 1982, Ser. No. 438,563
Int. Cl.[4] B23Q *3/00*
U.S. Cl. 269—16 **4 Claims**



1. A work tray assembly for facilitating a fiber optic splice, the assembly comprising:

a substantially rectangular board exhibiting a first pair of diametrically-positioned slots configured to accommodate the legs of a splice organizer and exhibiting a second pair of diametrically-positioned slots, said second pair substantially orthogonally arranged with respect to said first pair, configured to accommodate a fiber optic splice housing,

a plurality of arcuately-shaped flexible clips attached to the board for the retention of cladded glass fibers,

a least one pipelike ring mounted on the board for grasping vials containing chemicals used to strip and clean the cladded glass fibers, and

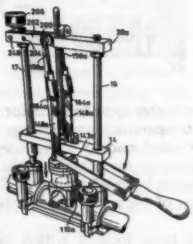
a pair of cable clamps positioned on opposite sides of the board at the ends of a virtual centerline drawn through the first pair of slots, said cable clamps for positioning and supporting fiber optic cables brought onto the work tray assembly and across the organizer in anticipation of a splicing operation.

4,556,207

CLAMPING APPARATUS FOR PLASTIC PIPE

Clifford F. Thompson, Weston, and Lawrence F. Thompson, Thornhill, both of Canada, assignors to Cliffside Pipelayers, Scarborough, Canada

Continuation-in-part of Ser. No. 358,359, Mar. 15, 1982, Pat. No. 4,445,677. This application Mar. 23, 1984, Ser. No. 594,339
Int. Cl.[4] B25B *1/20*
U.S. Cl. 269—41 **5 Claims**



1. An apparatus for clamping a plastic fitting against a plastic pipe and for holding them together with a predetermined clamping force, comprising:

a carriage,

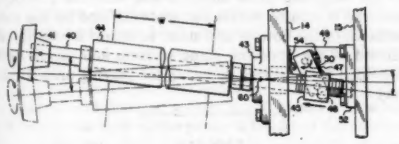
guide means for guiding the carriage in vertical motion,
a fixed pipe support portion below the carriage,
a frame portion fixed with respect to said pipe support portion,
a first toggle link pivoted to the carriage at a first axis,
a lever element which is pivoted to the frame portion at a fulcrum,
adjustment means for adjusting the angulation of said lever element about said fulcrum,
a second toggle link pivoted to said lever element at a second axis spaced from said fulcrum, the two toggle links being pivoted to each other at a third axis, the location of said second axis at which the second toggle link is pivoted to said frame portion being adjustable toward and away from said carriage with respect to the frame portion,
first means to prevent the toggle links from going significantly past a dead center position in which the three axes are aligned and the carriage is in its lowermost position,
second means connected to the carriage for holding said plastic fitting,
and lever means for rotating one of said toggle links.

4,556,208

WEB SKEWING APPARATUS

Roscoe Campbell, Dayton, Ohio, assignor to Harris Graphics Corporation, Melbourne, Fla.

Filed Aug. 6, 1984, Ser. No. 638,326
Int. Cl.[4] B65H *39/00*
U.S. Cl. 270—52 **13 Claims**



1. Web skewing apparatus comprising:
a shaft which has a threaded portion near one end,
rotation means for axial rotation of said shaft,
pivotal support means for pivotally supporting said shaft at a pivot point inward from said threaded portion,
a roller mounted on said shaft for supporting a web to be skewed,
a threaded block threadably mounted on said shaft along said threaded portion for axial movement in response to rotation of said shaft,
a link bar pivotally linked to said threaded block, and
a fixed mounting plate pivotally linked to said link bar such that axial movement of said threaded block causes pivotal motion of said shaft.

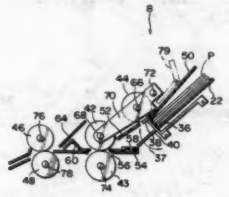
4,556,209

SHEET FEEDING APPARATUS

Shuzo Tsubo, Kawasaki, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Dec. 1, 1983, Ser. No. 556,782
Claims priority, application Japan, Dec. 1, 1982, 57-210898; Apr. 30, 1983, 58-76659
Int. Cl.[4] B65H *3/52*
U.S. Cl. 271—10 **15 Claims**

1. A sheet feeding apparatus for successively feeding sheets one by one from the top of stacked sheets, comprising:
a sheet table arranged oblique to the direction of gravity on which the sheets are stacked
pressing/stopping means having a member moveable to a position projecting at an intermediate portion of the sheet table for stopping the sheets on the intermediate portion of the sheet table when the member initially projects above the sheet table and which allows the sheets to move past the intermediate portion of the sheet table when the member is moved to a position below the sheet table;
feeding means arranged contactable with the top of the sheets stacked on the sheet table and serving to pick up the top sheet when in contact with it, and to feed it from the sheet table;



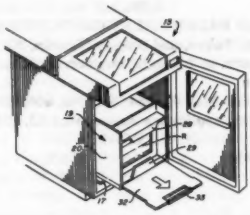
said member of said pressing/stopping means being intermittently moved to said projecting position, after said sheets are allowed to move past the intermediate portion of the sheet table, causing the top sheet of the stacked sheets to intermittently contact the feeding means; and
conveying means for conveying the sheets one by one when they are brought into contact therewith after having been fed by said feeding means.

4,556,210

HIGH SPEED DUPLICATOR WITH COPY SHEET PRE-LOADING RECEPTACLE

Clifford L. George, Macedon, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 21, 1983, Ser. No. 563,730
Int. Cl.[4] B65H *1/26*
U.S. Cl. 271—157 **1 Claim**



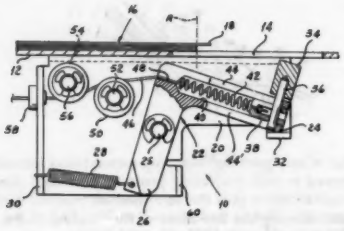
1. In a copier/duplicator having a sheet feeding apparatus, a sheet supply platform for supporting copy sheets and adapted to cooperate with the feeding apparatus to apply the sheets to the sheet feeding apparatus, the combination comprising,
a receptacle having a bottom element for supporting a stack of reams of sheets of paper and at least two side panels having lower ends and against which the reams of sheets are placed for registration and alignment,
said receptacle being adapted to be manually positioned upon the platform for the sheet feeding apparatus with said lower ends of the side panels placed on top of the platform and with the top of the stack of reams in operating association with the sheet feeding apparatus,
said side panels having means formed on said lower ends thereof for slidably receiving said bottom element, means for permitting the operator to slidably remove the bottom element relative to said side panels and therefore from said receptacle and thereby effect the placement of the stack of reams of sheets upon the sheet supply platform, and means for permitting the operator to slide said lower ends of said side panels relative to and away from the platform and thereby effect the removal of said receptacle from the copier/duplicator leaving the stack of reams remaining on the platform.

4,556,211

SHEET STACKING APPARATUS AND REGISTRATION MECHANISM THEREFOR

Roger D. Carr, Endicott, N.Y., assignor to Savin Corporation, Stamford, Conn.

Filed May 16, 1983, Ser. No. 494,951
Int. Cl.[4] B65H *33/02*
U.S. Cl. 271—221 14 Claims



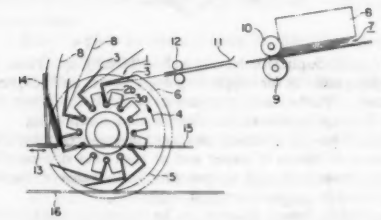
1. Sheet registering apparatus including in combination means for receiving a stack of sheets, said receiving means having a generally planar sheet-receiving surface, a support, a jogger element mounted for rectilinear movement on said support in a direction generally parallel to said surface, means mounting said support for movement of said support in a direction generally normal to said surface between a first position relatively remote from the plane of said surface and a second position relatively adjacent thereto, and means for moving said support from said first position to said second position and then moving said jogger element rectilinearly relative to said support into engagement with said stack.

4,556,212

STACKER FOR PAPER SHEET COUNTING APPARATUS

Hiroyoshi Nogi, Tokyo, and Shigeru Tanaka, Kashiwa, both of Japan, assignors to Musashi Engineering Kabushiki Kaisha, Tokyo, Japan

Filed May 4, 1984, Ser. No. 606,983
Claims priority, application Japan, May 13, 1983, 58-82780
Int. Cl.[4] B65H *29/00*
U.S. Cl. 271—315 4 Claims



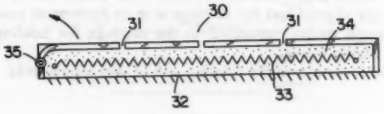
1. A stacker for a paper sheet counting apparatus comprising a rotatable drum, and a plurality of radially projecting blade members mounted substantially on and around the periphery of the drum in equally spaced apart relation from each other, each of said blade members being rigid and having substantially L-shaped configuration to provide first and second length portions of the blade member disposed in angular relation to each other, said first length portion having a free end mounted for freely pivotal movement on said drum for limited arcuate movement of said first length portion along said drum periphery and said second length portion extending from the opposite end of said first length portion in a direction opposite to the intended rotational direction of the drum, whereby the free end of said second length portion moves towards and away from said drum periphery responsive to said limited arcuate movement of said first length portion in respectively opposite directions.

4,556,213

REVERSIBLE PLAYING OR PERFORMANCE AREA

Devendra N. Sharma, 22 Carroll House Barrie Estate, Gloucester Terrace, London, Great Britain (W2 3PR)

Continuation-in-part of Ser. No. 477,840, Mar. 28, 1983, which is a continuation of Ser. No. 188,129, Sep. 17, 1980, abandoned.
This application Sep. 9, 1983, Ser. No. 530,704
Claims priority, application United Kingdom, Sep. 17, 1979, 7932145; May 20, 1983, 8314103
Int. Cl.[4] A63B *71/02*; A63C *19/00*
U.S. Cl. 272—3 17 Claims



1. A reversible playing or performance area assembly comprising:

at least one unit tray having first and second opposing plane surfaces;

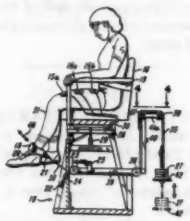
wherein each unit tray has a bottom and shallow sides, the outer surface of said bottom affording a base for the first of the opposing plane surfaces and wherein a bedding material is located within the space defined by the inner surfaces of the bottom and sides, to afford a base for the second of the opposing plane surfaces and means being provided for rotatably reversing the playing areas of said tray.

4,556,214

METHOD AND APPARATUS FOR EXERCISING

Jerrold S. Petrofsky, Beavercreek; Roger M. Glaser, Dayton; Steven H. Petrofsky, and Harry H. Heaton, III, both of Beavercreek, all of Ohio, assignors to Wright State University, Dayton, Ohio

Continuation of Ser. No. 417,935, Sep. 14, 1982, Pat. No. 4,480,830. This application Aug. 24, 1984, Ser. No. 644,167
The portion of the term of this patent subsequent to Nov. 6, 2001, has been disclaimed.
Int. Cl.[4] A63B *21/12*
U.S. Cl. 272—117 6 Claims



6. Apparatus for exercising a paralyzed leg comprising:

a chair including a seat,

load means for yieldably resisting lifting movement of a paralyzed leg of a person seated in said chair,

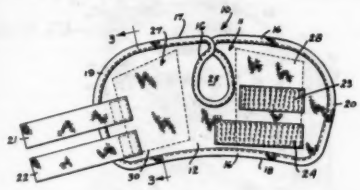
a profile generator for generating a profile signal representing a desired lifting profile for said leg,

feedback means for generating a feedback signal corresponding to actual lifting movement of said leg, and

stimulation means responsive to said feedback signal and to

said profile generator for stimulating normally paralyzed muscles within said leg to cause coordinated lifting movement thereof against the restraining action of said load means.

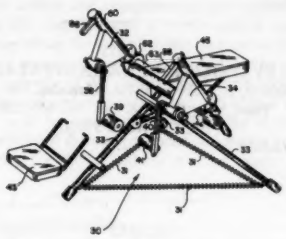
4,556,215
HAND EXERCISE WEIGHTS
Max R. Tarbox, Lubbock, and Nancy Rosales, Wolfforth, both of Tex., assignors to Tarbox, Inc., Lubbock, Tex.
Filed Feb. 10, 1984, Ser. No. 579,061
Int. Cl.[4] A63B *21/12*
U.S. Cl. 272—119 **6 Claims**



1. An exercise device to be selectively worn around either of a person's hands comprising an elongated body member having upper and lower fabric layers, said elongated body member having front and rear edge portions and first and second side edge portions, an opening disposed through said upper and lower fabric layers of said body member, said opening being disposed generally centrally between said first and second side edge portions, first and second pouch means formed between said upper and lower fabric layers of said body member, said first and second pouch means being similarly shaped and formed on opposite sides of said opening and between said opening and one of said first and second side edge portions so that one of said first and second pouch means will be situated adjacent to the back of the person's hand and the other of said first and second pouch means will be positioned adjacent the palm of the person's hand, first shiftable weights carried in said first pouch means and second shiftable weights carried in said second pouch means, said first and second weights being substantially the same so that said weights are generally equally distributed along both sides of the person's hand when the device is in use, at least one fastening means for securing said first and second side edge portions in overlapping relationship with one another when said elongated body member is placed around a person's hand, said fastening means including a strap means extending outwardly from one of said first and second side edge portions of said body member, and first engaging means attached to said upper fabric layer and between said opening and the other of said first and second side edge portions of said body member, said first strap means being selectively engageable with said first engaging means to secure said body member in place around a person's hand.

4,556,216
COMPUTER DIRECTED EXERCISING APPARATUS
Alan R. Pitkanen, 625 Warner Ave., Los Angeles, Calif. 90024
Filed Aug. 15, 1983, Ser. No. 523,330
Int. Cl.[4] A63B *17/00*
U.S. Cl. 272—126 **13 Claims**

1. Exercising apparatus including: a stand; first and second coupling units mounted on said stand displaced from one another along a horizontal axis, each of said coupling units being angularly adjustable about at least two axes to a multiplicity of positions to adapt the apparatus to a variety of different exercises; a rotatable shaft extending along said horizontal axis between said first and second coupling units and connected thereto; first and second crank arms respectively connected to said first and second coupling units, said first coupling unit being constructed so that rotation of said first crank arm in one direction exerts a torque on said one end of said shaft to cause said shaft to rotate in one direction, and said second coupling unit being constructed so that rotation of said second crank



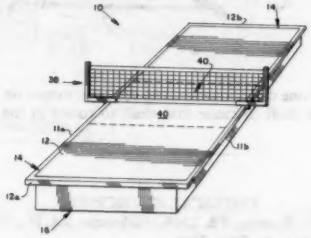
arm in said one direction exerts an opposite torque on the other end of said shaft to cause said shaft to rotate in the opposite direction.

4,556,217
PHYSICAL EXERCISER
Branislav R. Kochan, #5, 2368 Millbourne Rd. W., Edmonton, Alberta, Canada (T6K 3B4)
Filed Jan. 11, 1984, Ser. No. 569,893
Int. Cl.[4] A63B *21/02*
U.S. Cl. 272—141 **3 Claims**

1. A physical exerciser comprising:
a tubular member, each end of said member forming a pair of opposed first slots extending longitudinally of said member, said pairs of first slots lying in planes angularly disposed, one to the other;
a guide member adapted to be disposed within the tubular member and to extend substantially the latter's length, each end of said guide member forming a second slot extending longitudinally of said guide member and being in the plane of the adjacent pair of first slots, said guide member forming two pairs of peripheral passageways extending longitudinally along its length, one such pair of passageways being in the plane of one second slot, the other such pair of passageways being in the plane of the other second slot;
two pairs of compression springs which may be positioned in the passageways;
a pair of tubular handle members adapted to be slidably mounted on the tubular member, one of each end thereof;
a pair of pins, each being connectable with a handle member, so as to extend transversely through one pair of first slots and the adjacent second slot, whereby movement of the handle member inwardly on the tubular member will cause the pin to press against the ends of the pair of springs in the passageways aligned with said second slot, thereby to compress said springs;
a first step means, connectable to the tubular member at one of its ends, for preventing longitudinal displacement of the adjacent ends of one pair of springs;
a second stop means, connectable to the tubular member at the other of its ends, for preventing longitudinal displacement of the adjacent ends of the other pair of springs;
and means for retaining the handle members on the tubular member;
whereby the tubular and guide members combine to maintain each pair of springs in parallel, spaced-apart, side-by-side, coplanar, straight condition and the hand[l]e members

may be simultaneously forced toward the mid-point of the tubular member, each such handle member being operative to compress only the pair of springs against which its pin bears.

4,556,218
ELEVATED COURT GAME APPARATUS
David J. Barron, 17 Lakewood Dr., Dunedin, Fla. 33528
Filed May 30, 1984, Ser. No. 615,220
Int. Cl.[4] A63B *39/00*
U.S. Cl. 273—30 **3 Claims**



1. An apparatus for playing a game of the type where the players of the game stand adjacent the apparatus or move about relative to the apparatus during the playing of the game, comprising,

an integrally formed, flat, relatively thin, generaly rectangular in configuration, playing surface,

support means for rigidly supporting said playing surface in vertically spaced, horizontally disposed relation to the ground or other flat support surface upon which the players stand or move about in the course of the game,

said support means comprising a relatively thick base member of generally rectangular configuration,

said base member having a thickness, or height, of approximately one foot,

said base member having a flat bottom surface that abuttingly engages the ground or other flat support surface,

said playing surface, accordingly, being disposed approximately one foot above the ground or other support surface,

said base member having length and width dimensions less than the corresponding length and width dimensions of said playing surface to provide an overhang of said playing surface relative to said base member on all sides of said apparatus,

a ball member adapted to bounce on said playing surface,

said ball member having a core surrounded by a layer of rubber surrounded by a plastic covering,

a racquet member for striking said ball,

a transversely disposed net member disposed in bisecting relation to said playing surface,

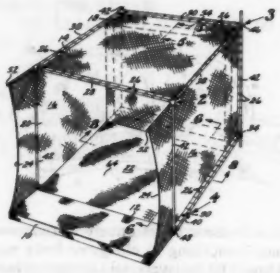
means to attenuate the amplitude of bounce of a ball member landing near said net member,

said attenuation means provided in the form of a relatively soft area of said playing surface disposed substantially mid-length of said playing surface upon which said ball member bounced poorly, said soft area being generally rectangular in configuration and being disposed substantially in registration with said net so that it is bisected by said net,

said soft area being imperforate and being flat so that a ball member bouncing thereon reacts against such soft area in the same manner that such ball member reacts against the playing surface, with the only difference in reaction being an attenuation in the amplitude of the bounce of the ball member,

said soft area being coplanar with said playing surface so that a ball member landing upon said soft area will remain in play despite the poor bounce caused by said soft area and so that the path of travel of a ball member landing on a point of demarcation between said soft area and the playing surface will not be deflected or changed by landing on such point of demarcation.

4,556,219
GOLF PRACTICE CAGE
Thomas H. Tillery, 13371 Lee Dr., Westminster, Calif. 92683
Filed Jun. 25, 1984, Ser. No. 624,416
Int. Cl.[4] A63B *67/02*
U.S. Cl. 273—181 F **5 Claims**



1. A golf practice cage comprising:

a platform upon which a golfer can stand while hitting golf balls, and including a ball collection section for receiving golf balls at a ball collection level;

a frame including a plurality of rigid, interconnected elongated frame elements;

a plurality of nets defining an enclosure having a top, a pair of sides, a rear and a front opening onto said platform, one of said nets constituting a floor net sloping downwardly from a target level adjacent the base of said rear to said ball collection level;

a plurality of attachment members extending between and connected to said nets and said frame elements to support and tauten said nets on said frame in spaced relation to said frame elements to prevent impact of flying balls against said frame elements;

a layer of damping material overlying said floor net for preventing dangerous rebounding of flying golf balls;

a plurality of laterally spaced apart tension elements underlying said floor net and extending between said front and rear frame elements; and

a plurality of tightening means connected between said plurality of tension elements, respectively, and one of said front and rear frame elements, and operable to tauten said tension elements and urge said floor net into a generally planar surface sloping from said target level to said ball collection level.

4,556,220
SOLID GOLF BALLS
Ichiro Tominaga, Kobe, and Akihiro Nakahara, Ibaraki, both of Japan, assignors to Sumitomo Rubber Industries, Ltd., Hyogo, Japan
Filed Jun. 7, 1984, Ser. No. 618,448
Claims priority, application Japan, Jun. 10, 1983, 58-104667; Jun. 10, 1983, 58-104668; Jun. 10, 1983, 58-104669
Int. Cl.[4] A63B *37/00, 37/06*
U.S. Cl. 273—218 **5 Claims**

1. A solid golf ball comprising a rubber component selected from the group consisting of polybutadiene and polybutadiene with up to 10% of synthetic or natural polyisoprene, an α,β-monoethylenic unsaturated carboxylic acid salt of a divalent metal grafted thereto, and

at least one molecular weight regulating agent selected from

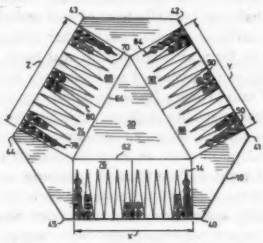
the group consisting of 2-(4-morpholinyldithio)benzothiazole, 4,4'-dithio-bis-dimorpholine, dipentamethylenethiuram tetrasulfide and derivatives thereof, said regulating agent being present in an amount of about 0.1 to about 10 parts by weight based on 100 parts by weight of the rubber component.

4,556,221

BACKGAMMON BOARD GAME FOR THREE PLAYERS

Wayne R. Borland, 7 Crescent Pl., Apt. #2308, Toronto, Ontario, Canada (M4C 5L7)

Filed Jun. 8, 1983, Ser. No. 502,307
Claims priority, application Canada, Jun. 18, 1982, 405462
Int. Cl.⁴ A63F *3/00*
U.S. Cl. 273—248 **16 Claims**



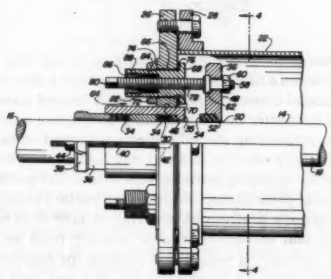
7. A board game comprising a playing surface having lines of demarcation forming three groups of twelve playing positions, each playing position being large enough to accommodate a number of playing pieces and the playing positions of each group being arranged side-by-side in a row, said three groups of positions outlining a central triangle, each group being positioned along a respective side of said central triangle, three sets of playing pieces with each set having twenty pieces, each set of playing pieces having two differently marked groups of ten pieces each, and three random number selection means each adapted for the random selection of a number from 1 to 6.

4,556,222

AUXILIARY SEALING SYSTEM FOR FLUID MIXERS

Donald E. Lewis, R.R. 2, Box 90, Letts, Iowa 52754, and Delmar D. Lewis, R.R. 1, Box 14 B, Muscatine, Iowa 52761

Filed Oct. 29, 1984, Ser. No. 666,014
Int. Cl.⁴ F16J *15/06*
U.S. Cl. 277—9 **8 Claims**



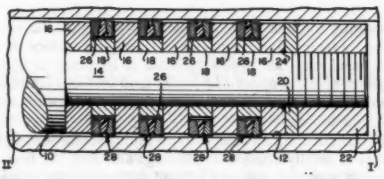
1. In a fluid mixer having a compartment including walls, one of which has a circular opening, a shaft extending rotatably through the opening and having inner and outer portions respectively within and exteriorly of the compartment, and an external seal cooperative between the shaft outer portion and the wall and sealing the opening against escape of fluid from the compartment, the improvement residing in interior seal means comprising an annular seal element fitting the shaft inner portion within the compartment and normally spaced axially inwardly from the wall, a carrier within the compartment and supporting the seal elements and movable axially of the shaft, and operating means connected to the carrier and extending exteriorly of the compartment for selectively moving the carrier and seal element toward and against the interior face of the wall for temporarily sealing the shaft and wall element interiorly of the compartment said means being reversible for moving the carrier and seal element axially away from the wall.

4,556,223

SEALING MEANS WITH SPACED ANNULAR SEALS HAVING SUPPORT RINGS

Donald F. VanLoon, Painted Post, and Bernard F. Miller, Corning, both of N.Y., assignors to Ingersoll-Rand Company, Woodcliff, N.J.

Continuation-in-part of Ser. No. 479,437, Mar. 28, 1983, abandoned. This application Jul. 31, 1984, Ser. No. 636,433
Int. Cl.⁴ F16J *15/38*
U.S. Cl. 277—118 **9 Claims**



1. Means for sealing an annular surface of an elongate element between high and low fluid pressure environments of the surface comprising:

a plurality of one-piece, annular seals; wherein

each of said seals fully circumferentially sealingly engages a given portion of said surface;

said seals are spaced apart from each other lengthwise of said element;

each of said seals has an inside diametrical surface and outside diametrical surface; and

each of said seals has an inclined side surface, joining said inside and outside surfaces which define one of said diametrical surfaces of shorter axial length than the other thereof; and further including

support rings for said seals;

each said support ring having an inclined side surface which (a), in conformation, is a mirror-image complement of, and (b), defines an engaging interface with a said inclined side surface of one of said seals; and

spacer means (a) interposed between said seals and (b) circumjacent said other diametrical surfaces of said seals, defining first annular voids between (a) said spacer means and said other diametrical surfaces and (b) second annular voids between said spacer means and side surfaces of said seals.

4,556,224

CROSSOVER SEAL ASSEMBLY

Tri C. Le, Missouri City, Tex., assignor to Joy Manufacturing Company, Pittsburgh, Pa.

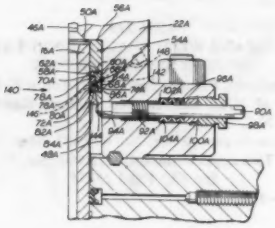
Filed Aug. 6, 1984, Ser. No. 637,994
Int. Cl.⁴ F16J *15/18*
U.S. Cl. 277—118 **11 Claims**

1. A packing assembly for sealing an annulus between spaced inner and outer cylindrical surfaces arranged in concentric relationship, the outer cylindrical surface having an inwardly

extending shoulder defining an annular support surface facing toward the annulus, the packing assembly being positioned within the annulus and comprising:

an upper first metal seal ring having an upper annular end surface abutting the annular support surface, an annular groove in its outer peripheral surface to form upper and lower annular land surfaces adapted to seal with the outer cylindrical surface, and an inner peripheral surface defining a downwardly facing first frusto-conical wedging surface;

a lower second metal seal ring having an outer peripheral surface defining an upwardly facing second frusto-conical



wedging surface with a matching angle to the downwardly facing first frusto-conical wedging surface of said first seal ring, an annular groove in its inner peripheral surface to form upper and lower land surfaces adapted to seal with the inner cylindrical surface, and a bottom annular end surface;

means for effecting an axial load on said first and second seal rings to axially compress said rings allowing the first and second wedging surfaces of said respective seal rings to interact providing for radial expansion of said first and second seal rings whereby the respective upper and lower land surfaces of the seal rings are placed in sealing engagement with the inner and outer cylindrical surfaces.

4,556,225

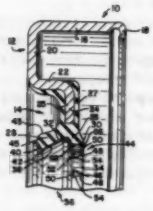
REVERSE LIP POSITIVE VENTING SEAL

Gordon T. Drygalski, Chicago, Ill.; Dennis L. Otto, Malvern, and Donald K. Ross, Eastlake, both of Ohio, assignors to Chicago Rawhide Mfg. Co., Elgin, Ill.

Filed Apr. 13, 1983, Ser. No. 484,490

Int. Cl.⁴ F16J *15/32*

U.S. Cl. 277—152 **12 Claims**



1. A fluid seal for retaining lubricant within a sealed region during relative movement of a first machine member and a shaft associated in use with said machine member, said seal comprising, in combination, a relatively rigid casing portion adapted to be received in fluid tight relation with respect to said first machine member, and a sealing lip body having portions adapted to contact said associated shaft, said casing including a mounting surface portion adapted for snug engagement with respect to said first machine member, and a bonding portion adapted to have a portion of an associated sealing lip body bonded thereto, said sealing lip body being bonded to said bonding portion of said casing and comprising a primary lip portion and an auxiliary lip portion said primary lip portion being defined at least in part by an axially innermost, radially inwardly and axially inwardly extending, annular oil side surface, an axially spaced apart, generally frusto-conical air side surface, and an annular, primary seal band surface which is generally cylindrical in its relaxed condition and which extends between the innermost edges of said oil side and air side surfaces, said seal band surface having thereon at least one hydrodynamic pumping element, said element having a radially inwardly directed, shaft-engaging surface portion and at least one working surface, said auxiliary lip portion being defined in part by a first frusto-conical surface partially directed in use toward said shaft and away from said sealed region, and a second frusto-conical surface directed partially towards said shaft and partially toward said sealed region, said frusto-conical surfaces meeting each other along a generally circular locus to form an auxiliary lip seal band, said second surface defining said portion of said auxiliary lip and said air side surface of said primary lip being axially spaced from each other and at least partially defining therebetween an annular groove of generally V-shaped cross-section, said seal being adapted for reception over an associated shaft to provide a generally fluid tight seal, with said pumping element being adapted, in its relaxed condition, to space parts of said primary seal band slightly apart from said associated shaft in use to provide vent means permitting the free passage of gas and vapor from said sealed region, without substantial prior pressure buildup in said region.

4,556,226

WATER-PROOF CONNECTOR

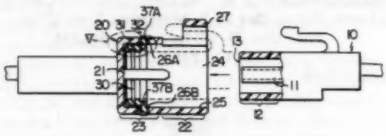
Katsuya Ito, Yokkaichi, Japan, assignor to Tokai Electric Wire Company Limited, Yokkaichi, Japan

Filed Jul. 6, 1984, Ser. No. 628,382

Claims priority, application Japan, Jul. 15, 1983, 58-110870[U]

Int. Cl.⁴ H01R *13/52*

U.S. Cl. 277—207 A **8 Claims**



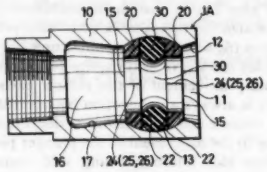
1. A water-proof connector comprising a seal ring in the coupling between a first connector housing with a first connector and a second connector housing with a second connector, said second connector housing defining an opening adapted to receive a corresponding shaped projection formed on said first connector housing wherein said seal ring includes a cylindrical portion and an engaging portion, said cylindrical portion including annular protrusions, said engaging portion including at least two engaging protrusions, seal ring stopper slots extending through said second connector housing from its outer surface and terminating within said opening for engaging and retaining said engaging protrusions of said seal ring in the peripheral wall of said first connector housing, said engaging protrusions of said seal ring being sealingly engaged with said projection of said first connector housing while said first connector housing is inserted into said second connector housing, thereby pressing said annular protrusions of said seal ring for water-proofing purpose.

4,556,227

UNIVERSAL PIPE JOINT ASSEMBLY

Toshiyuki Sato, and Tadayuki Kaida, both of Daito, Japan, assignors to Kabushiki Kaisha Suiken, Osaka, Japan

Filed Oct. 1, 1984, Ser. No. 656,468
Int. Cl.⁴ F16J *15/10*
U.S. Cl. 277—207 A **6 Claims**



1. A universal pipe joint assembly comprising

a connector housing having an internal axial space formed in a body of said connector housing,

said internal axial space including a main cavity interposed between an opening mouth and a sub-cavity in communication therewith,

said main cavity being defined by an internal spherical concave wall of said body of said connector housing,

a pair of split rings which are axially spaced and symmetrically arranged within said main cavity, with their inclined external circumferential walls disposed in relatively slidable contact with said internal spherical concave wall of said body of said connector housing,

each of said pair of split rings being deformable for reduction of its diametrical dimension so as to be inserted through said opening into said main cavity and expansible within said main cavity to take its operating position, and

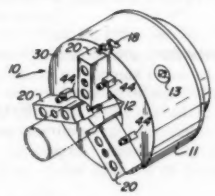
a spacer seal ring sandwiched between said pair of split rings.

4,556,228

JAW LOCKING MECHANISM FOR LATHE CHUCKS HAVING A SOFT JAW, A MASTER JAW AND A KEY BLOCK

Thomas A. Ferraro, Hatfield, Pa., assignor to Lock Jaws, Inc., Conshohocken, Pa.

Filed Nov. 19, 1984, Ser. No. 672,661
Int. Cl.⁴ B23B *31/10, 31/16*
U.S. Cl. 279—1 SJ **8 Claims**



1. In a lathe chuck having a master jaw guided for sliding movement relative to a chuck body in ways in the chuck body extending radially to a chuck axis by a jaw setting means of a lathe to a workpiece holding position, and a soft jaw mounted on and secured to the master jaw for conjoint movement therewith as a unit, the master jaw and the soft jaw being mounted for movement across a face of the lathe chuck as the master jaw slides in the ways, the ways and the master jaw having opposed surface portions limiting movement of the master jaw toward the chuck face, the improvement comprising:

a slot in the bottom of the soft jaw extending transversely therethrough,

and means for frictionally locking said master jaw and soft jaw unit in a fixed position relative to the chuck body including

a block mounted in said transverse slot,

said block having portions extending laterally from sidewalls of the soft jaw in generally parallel relation to the chuck face,

leg members having ends extending from said extended portions of said block towards the chuck face for frictionally engaging the same at the ends of said leg members, and

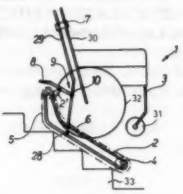
actuating means for causing the ends of said leg members to come into frictional engagement with the chuck face and said soft jaw to move away from said chuck face to cause said opposed surface portions of said master jaw and the ways to be frictionally engaged so that said master jaw and soft jaw unit is frictionally locked in a fixed position relative to the chuck body, wherein said leg members are threadedly mounted in said extended portions of said block so that rotation thereof in said threaded mounting causes movement of the leg members toward or away from the chuck face.

4,556,229

STAIR-CLIMBING APPARATUS FOR WHEELCHAIR

Franz Bihler, and Anton Abele, both of Augsburg, Fed. Rep. of Germany, assignors to Kleindienst GmbH, Augsburg, Fed. Rep. of Germany

Filed Jul. 7, 1983, Ser. No. 511,791
Claims priority, application Fed. Rep. of Germany, Jul. 9, 1982, 3225680
Int. Cl.⁴ A61G *5/00*; B62B *5/02, 9/02*; B62D *55/00*
U.S. Cl. 280—5.22 **10 Claims**



1. An apparatus for moving a wheelchair on a flight of steps, the apparatus comprising:

a support adapted to engage underneath the wheelchair in an upright condition of same, the wheelchair being pivotal on the support between erect and inclined positions;

two endless tracks on the support and supporting same and the wheelchair carried thereon, whereby the tracks allow the wheelchair to move over uneven terrain and on stairs;

latch means on the support including a latch element displaceable between a holding position for securing the wheelchair in the inclined position and a freeing position for permitting the wheelchair to move freely between its positions; and

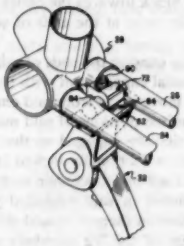
means connected to the latch element, responsive to the inclination of the tracks relative to the horizontal, and having a retaining dog movable into a position directly juxtaposed with the latch element for rotationally blocking the latch element from moving into the freeing position when the forward end of the tracks are inclined downwardly at more than a predetermined angle to the horizontal, whereby the wheelchair cannot be released from the support when same is moving on an incline.

4,556,230

BICYCLE KICKSTAND

Robert L. Diekman, Centerville, Ohio, assignor to The Huffy Corporation, Miamisburg, Ohio

Filed Mar. 4, 1985, Ser. No. 707,708
Int. Cl.[4] B62H *1/02*
U.S. Cl. 280—301 11 Claims



1. A kickstand of the type having a housing including transverse flange means at an upper end thereof and sized to extend beneath a pair of chain stays, and leg means pivotally attached to said housing, the improvement comprising:

lower jaw means attached to said flange means at substantially a midportion thereof for engaging a chain stay cross brace;

upper jaw means for engaging a chain stay cross brace; and

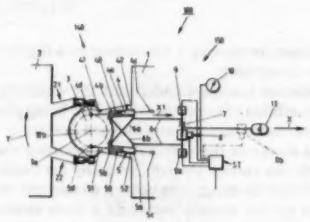
means for adjustably attaching said upper jaw means to said housing such that said upper jaw means may be superposed to said lower jaw means and clamped thereto such that a chain stay cross brace may be held therebetween.

4,556,231

APPARATUS FOR PREVENTING UNINTENTIONAL BENDING OR JACKKNIFING AND FOR IMPROVING LATERAL TRAVELLING STABILITY IN AN ARTICULATED VEHICLE

Rainer M. Schultz, Lagerlöfstrasse 19, 2000 Hamburg 65, Fed. Rep. of Germany

Filed Jul. 8, 1983, Ser. No. 512,412
Claims priority, application Fed. Rep. of Germany, Apr. 20, 1983, 3314282
Int. Cl.[4] B62D *53/00*
U.S. Cl. 280—432 12 Claims



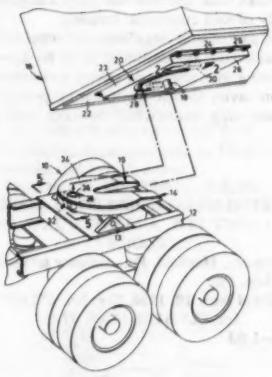
1. An apparatus for preventing unintentional bending in or jackknifing and for improving the lateral travelling stability under critical road and travelling conditions, arranged to be located in the fulcrum area of an articulated vehicle formed of a front vehicle part and a rear vehicle part connected in articulated manner thereto, with one of the two vehicle parts being motor-driven, and suitable for semi-trailers, articulated buses or vehicles having a towed vehicle part, a supporting device arranged to pivotally connect the two vehicle parts together and including a pivot joint having a pivot axis, wherein the improvement comprises that said supporting device (**140**) comprises a pair of hydraulic cylinder units (**4,5**), each said hydraulic cylinder unit (**4,5**) comprises an elongated casing (**42,52**) having a first end and a second end and divided by a plunger piston (**40,50**) into a pair of liquid chambers (*4a,4b,5a,5b*), a piston rod (**41,51**) connected to said plunger piston and extending out of the second end of said casing, said casing (**42,52**) arranged to be articulated at the first end to one of the vehicle parts and said piston rod extending out of the second end of said casing arranged to be articulated to the other one of said vehicle parts at a position spaced from the pivot axis (*3a*) of said pivot joint (**3**), so that the connections of said casing (**42,52**) are located on opposite sides of said pivot axis (*3a*), connection lines (*6a,6b*) each interconnecting one liquid chamber (*4a,4b,5a,5b*) in each of said casings (**42,52**) so that during horizontal rotary movement of the vehicle parts toward one another, there is always a connection between said chambers increasing in volume and said chambers decreasing in volume corresponding to the movement of the plunger piston, another connection line (*6c*) interconnecting said connection lines (*6a,6b*), and a flow limiting device (**150**) located in said another connection line (*6c*).

4,556,232

TRACTOR-TRAILER COUPLING DEVICE

John I. Sever, 4 Nancy Dr., St. Catharines, Ontario, Canada (L2M 1Y5)

Filed Apr. 23, 1984, Ser. No. 603,268
Claims priority, application Canada, Sep. 20, 1983, 437123
Int. Cl.[4] B62D *53/08*
U.S. Cl. 280—432 6 Claims



1. In a safety device for use with a tractor and semitrailer using a fifth wheel having a kingpin for coupling the tractor with the semitrailer, wherein an auxiliary pin is insertable through an aperture in the fifth wheel upwardly into an arcuate slot located on the underside of the semitrailer and concentric with the kingpin, the improvement comprising:

a carrier frame fixed to the fifth wheel on the underside thereof;

a sleeve mounted on the carrier frame in axial alignment with the aperture in the fifth wheel, the auxiliary pin being slidable axially in the sleeve and having an arcuate cam groove in the cylindrical surface thereof, an inwardly projecting follower pin of the sleeve engaging the arcuate groove; and

means mounted on the carrier frame to advance the auxiliary pin into the arcuate slot and to retract the auxiliary pin therefrom, the auxiliary pin being rotated axially in the sleeve during said advancement and retraction thereof by the interaction of the follower pin and the cam groove;

the auxiliary pin having a circumferential groove adjacent the lower end thereof, the advancement and retraction means comprising a bell crank arm pivotably mounted on

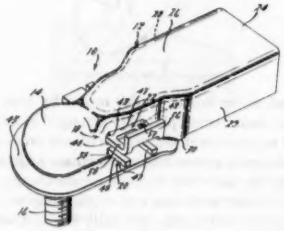
the carrier frame, one end of the crank arm having a yoke engagable with the groove of the auxiliary pin, and a fluid actuated cylinder and piston assembly mounted on the carrier frame with the piston connected to the other end of the crank arm.

4,556,233

TRAILER COUPLER

Karl E. Richter, Sheboygan, and Edward W. Ebey, Nashotah, both of Wis., assignors to Fulton Manufacturing Corporation, Milwaukee, Wis.

Filed Nov. 28, 1983, Ser. No. 555,519
Int. Cl.⁴ B60D *1/06*
U.S. Cl. 280—513 **13 Claims**



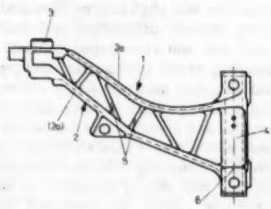
1. A coupler for use with a hitch system, said coupler comprising:
   a body member having a socket portion for receiving said hitch system; and
   a closure means movably mounted on said body member for movement to an open position, closed position, and a third position such that said hitch system can enter and exit said socket portion when said closure means is in an open position, said hitch system being locked in said socket portion when said closure means is in said closed position, and said closure means providing a visible indication that said socket portion has received an undersized hitch or is disengaged from said hitch system when in said third position.

4,556,234

CAST WHEEL FORK FOR MOTOR VEHICLE AXLE

Fritz Mahnig, Schaffhausen, and Herbert Meister, Thayngen, both of Switzerland, assignors to Georg Fischer Aktiengesellschaft, Switzerland

Filed Oct. 18, 1983, Ser. No. 543,136
Claims priority, application Switzerland, Oct. 19, 1982, 6080/82
Int. Cl.⁴ B60G *3/06*
U.S. Cl. 280—688 **9 Claims**



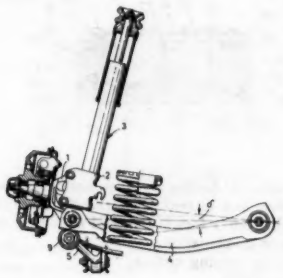
1. A cast wheel fork for a motor vehicle axle, comprising an arm having a first longitudinal axis and a substantially hat-shaped transverse cross-sectional configuration formed by first and second substantially parallel arm members and a plurality of crossbars connecting said arm members;
   a wheel support at one longitudinal end of said arm; and
   a bearing at an opposite longitudinal end of said arm, said bearing extending along a second longitudinal axis.

4,556,235

INDEPENDENT WHEEL SUSPENSION FOR NON-STEERED WHEELS OF MOTOR VEHICLES

Frank Giebel, Bergheim-Busdorf, Fed. Rep. of Germany, assignor to Ford Motor Company, Dearborn, Mich.

Filed Feb. 24, 1984, Ser. No. 582,980
Claims priority, application Fed. Rep. of Germany, Feb. 24, 1983, 3306432
Int. Cl.⁴ B60G *3/18*
U.S. Cl. 280—690 **10 Claims**



1. An independent wheel suspension for non-steered wheels of motor vehicles comprising:
   a wheel support;
   a transverse control arm pivotally attached at its inboard end to the chassis and at its outboard end to said wheel support; and
   means for connecting said transverse control arm to said wheel support and for rotating said wheel support relative to said transverse control arm about substantially vertical axes during compression and rebound movement of said wheel support whereby the toe angle of said wheel support will be controlled.

4,556,236

INFLATABLE GAS CUSHION

Hans J. Scholz, Waldenbuch, and Helmut Patzelt, Feilbach, both of Fed. Rep. of Germany, assignors to Daimler-Benz AG, Fed. Rep. of Germany

Filed Sep. 22, 1983, Ser. No. 534,826
Claims priority, application Fed. Rep. of Germany, Sep. 23, 1982, 3235176
Int. Cl.⁴ B60R *21/08*
U.S. Cl. 280—729 **9 Claims**

1. An inflatable gas cushion fillable with gases for the protection of passengers of vehicles including a frangible closed container means arranged inside of the gas cushion filled with

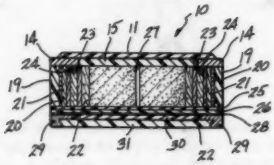
substances for neutralizing selected properties of said gases, said container means being automatically opened during inflation of the inflatable gas cushion.

4,556,237

ALPINE SKI WITH SELECTIVE REINFORCEMENT

Franklin D. Meatto, Cromwell, and Edward D. Pilpel, Manchester, both of Conn., assignors to Olin Corporation, Cheshire, Conn.

Filed Feb. 22, 1984, Ser. No. 582,404
The portion of the term of this patent subsequent to Oct. 8, 2002, has been disclaimed.
Int. Cl.⁴ A63C *5/00*
U.S. Cl. 280—610 **13 Claims**



1. In a snow ski having a predetermined cross-section with opposing first and second sides, the ski extending a desired axial length from a forward shovel area to a rear tail area, comprising in combination:

(a) a bottom running surface;

(b) a top surface;

(c) a core positioned between the bottom running surface and the top surface;

(d) a compression carrying laminate layer positioned above the core and below the top surface;

(e) a binding area intermediate the tail area and the shovel area having a front poriton nearest the shovel area and a rear portion nearest the tail area;

(f) a main facing laminate layer positioned below the core and above the bottom running surface for carrying the substantial portion of the tensile loading in flexure;

(g) top edge means extending substantially the axial length along the opposing first and second sides of the ski adjacent the compression carrying laminate layer;

(h) bottom edge means extending substantially the axial length along the opposing first and second sides of the ski adjacent the bottom running surface to provide wear-resistant surfaces; and

(i) at least one high strength fiber reinforcing means generally horizontally positioned at least partially in a slot in the core within the cross-section extending forwardly from the front portion of the binding area to the shovel area and rearwardly from the rear portion of the binding area to the tail area external of the compression carrying laminate layer in the compression portion of the cross-section to increase the flexural response and compressive strength of the ski.

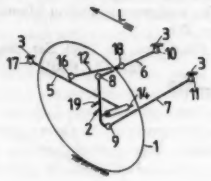
4,556,238

INDEPENDENT WHEEL SUSPENSION FOR MOTOR VEHICLES

Wolfgang Matschinsky, Munich, Fed. Rep. of Germany, assignor to Bayerische Motoren Werke Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Aug. 29, 1984, Ser. No. 645,422
Claims priority, application Fed. Rep. of Germany, Aug. 30, 1983, 3331247
Int. Cl.⁴ B60G *3/20*
U.S. Cl. 280—701 **22 Claims**

1. An independent wheel suspension for motor vehicles, comprising wheel carrier means supporting a vehicle wheel, a relatively fixed vehicle part, means connecting the wheel carrier means with said fixed vehicle part including three guide means pivotally connected at said fixed vehicle part, one of said guide means being a longitudinal arm extending generally in the vehicle longitudinal direction and the other two guide means being cross guide members disposed one above the other and extending at least approximately in the vehicle transverse direction which are pivotally connected at the relatively



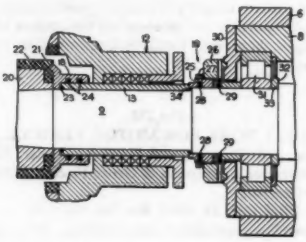
fixed part and at the wheel carrier means by joint means, the wheel carrier means being pivotally arranged at said longitudinal arm, and support strut means, one of said cross guide members being pivotally connected intermediate its joint means on the wheel carrier side and its joint means on the side of the relatively fixed part with one end of the support strut means while the support strut means pivotally engages with its other end at the longitudinal arm.

4,556,239

ARRANGEMENT AT A SHAFT SEAL

Bengt O. Eriksson, Sala, Sweden, assignor to Sala International Aktiebolag, Sala, Sweden

Filed Sep. 27, 1983, Ser. No. 536,944
Claims priority, application Sweden, Oct. 4, 1982, 8205635
Int. Cl.⁴ F16C *33/72, 33/74;* F04D *29/10*
U.S. Cl. 384—130 **7 Claims**



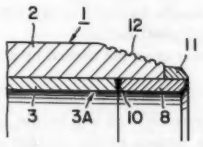
1. A sealing arrangement for a rotary shaft comprising a wheel fixedly mounted to said shaft for rotation therewith; said shaft presenting a shoulder opposing said wheel; a pipe-shaped element surrounding said shaft intermediate said shoulder and wheel; a sealing element surrounding said shaft intermediate said wheel said and said pipe-shaped element; a selectively adjustable fastening device intermediate said pipe-shaped element and said shoulder; said selectively adjustable fastening device having a first member in force transmitting relation with said shoulder and a second member which is selectively axially movable with respect to said shaft and with said second member in force transmitting relation with said pipe-shaped element; said first and second members of said selectively adjustable fastening device are provided with opposing threaded surfaces with a threaded surface of said first member threadedly engaging a threaded surface of said second member whereby said second member may be axially moved away from said first member toward said wheel by means of turning said first or second member with said first member restrained

from axial movement by means of said force transmitting relation between said first member and said shoulder.

4,556,240
CORROSION-RESISTANT, DOUBLE-WALL PIPE STRUCTURES

Toshio Yoshida, Kobe, Japan, assignor to Kawasaki Jukogyo Kabushiki Kaisha, Hyogo, Japan

Filed Jul. 29, 1982, Ser. No. 403,114
Claims priority, application Japan, Jul. 29, 1981, 56-117672
Int. Cl.⁴ F16L *9/14*
U.S. Cl. 285—55 **6 Claims**

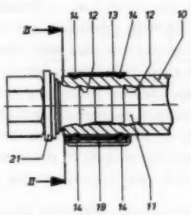


1. A corrosion-resistant double-wall pipe structure formed by interference-fitting a corrosion-resistant inner pipe in an outer pipe, said inner pipe, at a portion thereof which is liable to be adversely affected by heat due to heat processing to the pipe structure, being constituted by an inner tube of a nickel-base superalloy having corrosion resistance which is not easily imparied by said heat, said inner tube being joined integrally to the remaining, general portion of said inner pipe which is made of stainless steel, said inner tube being provided at an end of the pipe structure, the extreme end part of said outer pipe, at the end of said pipe structure provided with said inner tube, being replaced by an annular filling formed by overlay welding a corrosion-resistant metal around the end part of said inner tube and to the end face of said outer pipe, and tapered screw threads for screwing into a pipe coupling formed on the end portion of the pipe structure.

4,556,241
DEVICE TO CONNECT HOSE OR PIPE ENDS

Karl Weinhold, 4040 Neuss, Im Jagdfeld 43, Fed. Rep. of Germany

Filed May 17, 1983, Ser. No. 495,161
Claims priority, application Fed. Rep. of Germany, May 19, 1982, 3218965
Int. Cl.⁴ F16L *33/12*
U.S. Cl. 285—244 **9 Claims**

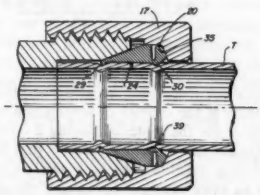


1. A device to connect hose or pipe ends, comprising a clamp-like ring which encircles the hose or pipe end in use and is provided with flanges extending inwardly which serve to press a hose onto a nozzle or which engage behind annular collars provided at the end of a pipe, and comprising a clamping lever fastener which, when the device is closed, connects the ends of the ring, the clamping lever engaging onto one end of the ring and having a spring engagable with the other end of the ring, wherein the clamp-like ring is provided in one piece and is made of a material which can be deformed by hand, and in that the flanges are formed by a permanent shaping of the ring, the flanges are provided with extensions which project beyond one end of the ring, and the extensions engage, in use, portions of the flanges provided at the other end of the ring.

4,556,242
VIBRATION RESISTANT HIGH PRESSURE TUBE FITTING

Leonard J. Kowal, Prospect Heights, and Albert J. Schwarz, Lincolnwood, both of Ill., assignors to Imperial Clevite Inc., Glenview, Ill.

Filed Nov. 25, 1983, Ser. No. 555,171
Int. Cl.⁴ F16L *19/08*
U.S. Cl. 285—341 **12 Claims**



1. In a flareless tube fitting having a body member defining a through bore opening at one end through an axially outwardly widening flared camming and sealing surface for receiving an end of a tube to be connected, a nut member coaxially threaded to said body member, and a sealing and gripping ferrule comprising an annular sleeve defining a through bore, said sleeve having an axially inner nose having a frustoconical outwardly widening radially outer surface and a distal axially and radially inner annular biting edge adapted to sealingly bite into and grip the outer surface of a tube end received in said bore end as an incident of urging of the sleeve axially inwardly by the nut against said camming and sealing surface, a radially outwardly opening groove axially outwardly of said nose defined by an axially inner surface, an axially outer surface, and a radially inner bottom portion defining with the through bore of the sleeve a radially thin, deformable ring portion, an axially outer deflectible portion defined by a distal end surface and said groove outer surface, and an inwardly facing, frustoconical outwardly narrowing force transfer surface on said nut member confronting said distal end surface of the sleeve, the improvement comprising both of said axially outer surface of said groove and said axially outer deflectible portion distal end surface being frustoconical axially outwardly widening, said nut member defining a radially inwardly facing stop surface at the radially outer end of said force transfer surface, the disposition of said stop surface and the angularity of said frustoconical force transfer surface of the nut being correlated with the angularity of the frustoconical distal end surface of the sleeve for turning, as an incident of forcible urging of said nut member toward said body member, said axially outer deflectible portion of the sleeve axially inwardly about said ring portion to an arrangement wherein the distal end surface of the sleeve is in facial engagement with said force transfer surface with said groove inner and outer surfaces in axially spaced relationship, and urging said ring portion radially inwardly into the tube end as it is turned to define a rounded support of the tube end effectively blocking transmission of vibration forces axially inwardly along the tube to said sleeve nose biting into said tube end thereby preventing loss of the sealing and gripping action of the sleeve nose relative to the tube end notwithstanding subjection of the tube end to vibration forces axially outwardly of said support.

4,556,243

SAND-DISPENSING DEVICE FOR MOTOR VEHICLES

Franz Cervinka, Oberleitenweg 35, A-6370 Kitzbühel, Austria

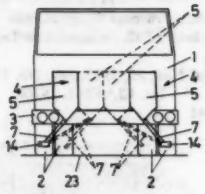
PCT No. PCT/AT83/00016, § 371 Date Feb. 1, 1984, § 102(e) Date Feb. 1, 1984, PCT Pub. No. WO83/04396, PCT Pub. Date Dec. 22, 1983

PCT Filed Jun. 8, 1983, Ser. No. 584,253

Claims priority, application Austria, Jun. 11, 1982, 2268/82

Int. Cl.[4] B60B *39/04*

U.S. Cl. 291—25 **8 Claims**



1. A device for dispensing an abrasive material by gravity onto a roadway in the vicinity of wheels of a vehicle, comprising a container for the material having a container discharge opening adjacent the bottom thereof, a first flap movable between a closing position blocking the container discharge opening to an open position permitting the discharge of the material from the container through the container discharge opening, housing means defining a channel discharge extending around and enclosing the container discharge opening and defining a channel discharge passage extending downwardly toward the roadway for the material exiting through the container discharge opening and having a lower end with a channel passage delivery opening, a second flap movable between a closing position blocking the channel passage discharge opening to an open position permitting the discharge of the material from the channel passage discharge opening, and control means connected to said first and second flaps for permitting separate movement of said flaps to permit the first flap to be closed first to stop the exit of material from the container and the second flap to remain open to permit the material already fed into the channel discharge passage to be discharged out of the channel passage, and then to permit the second flap to be closed, said control means operating to simultaneously move said first and second flaps from their closed position to their open position.

4,556,244

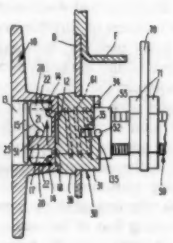
LATCH ASSEMBLY HAVING PULL-UP ACTION

Robert H. Bisbing, Springfield, Pa., assignor to Southco, Inc., Concordville, Pa.

Filed Jan. 26, 1984, Ser. No. 574,041

Int. Cl.[4] E05C *5/02*

U.S. Cl. 292—65 **23 Claims**



1. A latch having a pull-up action for developing a compressive force between a movable door and a fixed housing member, said latch comprising:

a. a latch body adapted to be mounted non-rotatably on a door;

b. said latch body including a sleeve adapted to project inwardly through an opening in said door;

c. an elongated shaft extending through and supported in said sleeve for axial and rotatable movement with respect thereto;

d. said shaft having a head portion and a threaded portion extending beyond said sleeve;

e. a latching pawl mounted on said threaded portion of said shaft for axial and angular movement with said shaft;

f. a rotatable handle having a cavity into which said head portion of said shaft extends;

g. a cam-follower cross pin carried by said head portion of said shaft;

h. an annular cam member within said handle cavity for rotatable movement with said handle, said cam having an annular cam surface having at 180° spacing two peak points, two low seats, and sloping surfaces therebetween, said low seats having steeply rising cam surfaces on both sides thereof;

i. spring means biasing said shaft axially in an unlatching direction, for maintaining said cam-follower pin in engagement with the camming surface of said cam;

j. a motion-control cross pin carried by said shaft on a portion thereof within said sleeve;

k. a pair of axially extending motion-control slots in said sleeve for receiving the opposite ends of said motion-control cross pin;

l. a pair of laterally extending arcuate motion-control recesses in said sleeve for receiving the opposite ends of said motion-control cross pin when said shaft is rotated;

m. the structural arrangement being such that when said rotatable handle and cam are at their limit positions in the latching direction, the opposite ends of said cam-follower cross pin are positioned on high portions of said cam surface just beyond said peak points, said shaft is in an outward position, said spring means is compressed, the opposite ends of said motion-control cross pin are within said axial motion-control slots of said sleeve and said latching pawl is in engagement with said fixed member, whereby said closure member is latched;

n. the structural arrangement being such that when said handle and cam are rotated in an unlatching direction from their limit latching positions, opposite ends of said cam-follower cross pin first pass said peak points on said cam surface and then move down sloping cam surfaces into the low seats, thereby permitting said spring-biased shaft to move axially in its biased direction, thereby moving opposite ends of said cam-follower cross pin through said axial motion-control slots to open ends thereof and into alignment with said lateral arcuate motion-control recesses; and

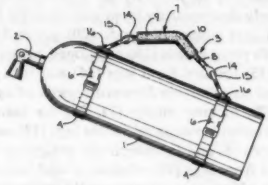
o. the structural arrangement being such that further rotation of said handle and cam in an unlatching direction causes said steeply rising portions of said cam surfaces to engage opposite ends of said cam-follower cross pin, thereby to move said cam-follower pin rotationally, thereby to rotate said shaft on its axis and to cause opposite ends of said motion-control cross pin to enter into said lateral arcuate motion-control recesses, whereby said latching pawl is positioned out of alignment with said fixed member, thereby allowing opening of said door.

4,556,245

CARRYING HANDLE ASSEMBLY FOR A DIVING TANK

Mark J. Gruenwald, Germantown, Wis., assignor to Clearwater Technologies Inc., Menomonee Falls, Wis.

Filed Oct. 24, 1984, Ser. No. 664,372
Int. Cl.[4] B65D *25/28, 63/18*
U.S. Cl. 294—31.2 5 Claims



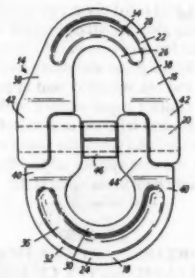
1. In combination a diving tank, a carrying handle assembly attached to the tank, said carrying handle assembly comprising a pair of tank straps encircling the tank and spaced longitudinally of the tank, a handle extending longitudinally of the tank and comprising a rigid tubular core having a central opening, said core including a first section and a second section disposed longitudinally of said first section and positioned at an angle of about 25° to 35° with respect to said first section, said handle also including a resilient layer secured to the outer surface of said core, a flexible member freely disposed within the central opening in said core, and means for removably connecting each end of the flexible member to the respective tank straps.

4,556,246

CHAIN COMPONENTS

Michael J. Millington, Kidderminster, United Kingdom, assignor to Parsons Controls Limited

PCT No. PCT/GB83/00108, § 371 Date Dec. 5, 1983, § 102(e) Date Dec. 5, 1983, PCT Pub. No. WO83/03649, PCT Pub. Date Oct. 27, 1983
PCT Filed Apr. 14, 1983, Ser. No. 568,229
Claims priority, application United Kingdom, Apr. 15, 1982, 8210973
Int. Cl.[4] B66C *1/12*
U.S. Cl. 294—82.11 3 Claims



1. A chain sling assembly comprising a main link having connector links positioned thereon, each connector link having a pair of shackles positioned thereon,

said main link being of unitary construction and having a pair of main link crown portions of generally semi-circular form with parallel extending side limbs connecting said main link crown portions,

said connector links being formed with first and second portions each including a crown portion formed with an inner and an outer circumferentially extending flange connected by a web extending parallel to a diametrical plane lying centrally of the crown portion, short parallel side limbs extending from said crown portion, said short parallel side limbs of the second portion being formed with end parts stepped inwardly and the short parallel side limbs of the first portion being formed with end parts stepped outwardly to embrace the end parts of the second portion, the said end parts of each portion being formed with a bore and a connecting pin extending through said bores,

said pair of shackles each formed with a pair of parallel extending side limbs connected by a shackle crown portion formed with an inner and an outer circumferentially extending flange connected by a web extending parallel to a diametrical plane lying centrally of the crown portion and having, at their free ends thereof, jaw hubs bored to receive a shackle pin,

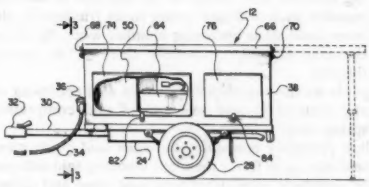
the crown portion of the first portion of the connector link being profiled to co-act with crown portions of the main link and the crown portion of the second portion of the connector link being profiled to co-act with crown portions of the pair of shackles, the end portions of the side limbs of the first portion of the connector link being spaced apart by a distance corresponding to the thickness of the crown portions of the main link in a direction perpendicular to the diametrical plane lying centrally of the said crown portion, and, the end portions of the side limbs of the second portion of the connector link being spaced apart by a distance corresponding to the thickness of the crown portions of the shackles in a direction perpendicular to the diametrical plane lying centrally of the said crown portion.

4,556,247

PORTABLE ELECTRIC GENERATOR FOR A VEHICLE

John M. Mahaffey, 1396 Calle Yucca, Thousand Oaks, Calif. 91360

Filed Sep. 2, 1983, Ser. No. 529,118
Int. Cl.[4] B60P *3/34*
U.S. Cl. 296—24 R 1 Claim



1. In combination with a motor operated wheeled land vehicle having an internal compartment, accessory electrically operated equipment attached to said vehicle, a trailer connected to said vehicle but spaced therefrom to be towed thereby as said wheeled land vehicle is operated, said trailer comprising:

a housing having an internal chamber, said internal chamber being divided into a plurality of separate compartments, said housing including a plurality of separate access doors, each said access door facilitating access into a single said separate compartment, said housing including a top, said top being movable relative to said housing from a closed position to an open position permitting access into a plurality of said compartments of said internal chamber; and

an internal combustion engine electrical generator being located within one of said separate compartments, switch means mounted within said internal compartment of said wheeled land vehicle, an electrical conductor connecting said switch means and said generator, said generator being activatable by said switch means, said generator being operable during movement of said vehicle, said accessory electrically operated equipment of said wheeled land

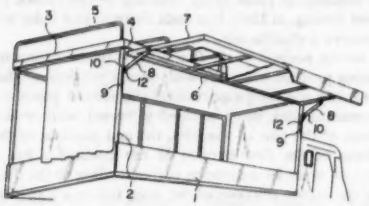
vehicle being connected to said generator to be operated thereby.

4,556,248

OPENABLE SIDE PANEL FOR LOAD CARRYING VEHICLES

Nobuo Kobayashi, Toyota, Japan, assignor to Meidai Bussan Kabushiki Kaisha, Toyota, Japan

Filed Feb. 8, 1984, Ser. No. 578,001
Int. Cl.⁴ B60J 7/16
U.S. Cl. 296—183 **19 Claims**



1. An openable side panel mechanism for a load carrying vehicle having a bed, comprising:

a pair of spaced frames adapted to be mounted on the bed of the load carrying vehicle at ends of the bed and provided with a spring enclosing member for receiving a compression coil spring therein;

a beam extending between and joined to said frames to form a frame assembly;

a side panel extending along and pivotably mounted on said beam and movable between open and closed positions in relationship to said pair of spaced frames, said side panel including at least one frame member;

a compression coil spring having one end movable in said enclosing member and the other end secured to the enclosing member, said spring being disposed in said enclosing member such that said spring slides frictionally along the inner wall of the enclosing member when the diameter of the coil expands outwardly due to the compression thereof;

a guide means movably disposed in said enclosing member and secured to said one end of said compression coil spring; and

a link pivotably connected between said guide means and said side panel frame member, whereby said side panel can be angularly moved between said open and closed positions under a force from said compression coil spring, and can be held at a desired position between said open and closed positions by the frictional engagement between said compression coil spring and the inner wall of said enclosing member.

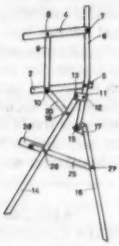
4,556,249

COLLAPSIBLE CHAIR

Kenzou Kassai, Osaka, Japan, assignor to Kassai Kabushikikaisha, Osaka, Japan

Filed Dec. 14, 1983, Ser. No. 561,538
Claims priority, application Japan, Dec. 27, 1982, 57-199330[U]
Int. Cl.⁴ A47C 4/00
U.S. Cl. 297—30 **6 Claims**

1. A collapsible chair comprising: a seat section (1) having a seat (2) and a backrest (3), a pair of backrest holding rods (6) pivotally supported at first pivot points (5) positioned on relatively back regions of opposite sides of said seat (2), said rods (6) extending upwardly and downwardly from said first pivot points (5) over respective predetermined lengths, the upper portions of said rods (6) holding said backrest (3), a pair of front legs (14) pivotally supported at second pivot points (13) positioned at relatively lower regions of the lower portions of said backrest holding rods (6), said front legs (14) being adapted to turn only forwardly from a position in which they are arranged side by side with said backrest holding rods (6), a pair of rear legs (16) pivotally supported at third pivot points (15) positioned on relatively lower regions of the lower portions of said backrest holding rods (6), said rear legs being adapted to turn only forwardly from a position in which they extend obliquely downwardly from said backrest holding rods (6), a pair of seat supporting rods (20) pivotally connected between fourth pivot points (19) positioned below said second pivot points (13) for said front legs (14) and fifth pivot points (10) positioned on relatively forward regions of opposite sides of said seat (2), locking means (21, 22) for maintaining the side-by-side relation between said front legs (14) and said backrest holding rods (6) and for selectively inhibiting the forward turning of said front legs (14) relative to said backrest holding rods (6), a pair of brackets (11) forwardly projecting from said backrest holding rod (6), one of said second pivot points (13) being positioned on each bracket (11), wherein each front leg



(14) is positioned forwardly of said backrest holding rod (6) and on a plane defined by a side of the backrest holding rod (6), wherein one end of a turning range of the front legs (14) is defined when each front leg (14) and the respective backrest holding rod (6) abut against each other along narrow sides, whereby a predetermined length of lower portions of said backrest holding rods extend substantially in parallel with a respective length of upper portions of said front legs along said narrow sides for keeping said chair in an open state, a pair of connecting plates (17) for pivotally supporting upper ends (18) of said rear legs at said third pivot points (15), each connecting plate (17) extending along a lateral surface of the upper end of the respective rear leg and rearwardly of the respective backrest holding rod (6) in a plane also along a side of the respective backrest holding rod (6), whereby said upper ends of said rear legs (16) directly contact a rear surface of the respective backrest holding rod (6), and wherein one end of a turning range of the rear legs (16) is defined when the upper end of each rear leg (16) abuts against the rear surface of the backrest holding rod (6) for keeping said chair in an open state.

4,556,250

TRANSPORTABLE ARTICLE HOLDER FOR STADIUM-TYPE CHAIRS

Athol W. Chapman, 17112 Twain La., Huntington Beach, Calif. 92649; Fred E. Cope, 146 12th St., Seal Beach, Calif. 92640, and Kenneth P. Missick, 1510 Camino Los Robles, Fullerton, Calif. 92633

Filed Jul. 11, 1983, Ser. No. 512,904
Int. Cl.⁴ A47C 7/62
U.S. Cl. 297—192 **12 Claims**

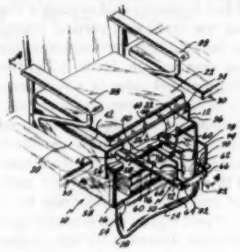
1. An article holder for stadium type chairs which comprises:

a support member sized and shaped so as to be positionable on the underside of the seat portion of a stadium type chair;

a flexible sleeve means sized and shaped to fit across the top

and along the sides of the seat portion of said stadium type chair, and to extend over said seat portion to the underside of said seat portion:

said support member operatively attached to said flexible sleeve means so as to be supported beneath and in contact with the underside of the seat portion of said stadium type chair, together said flexible sleeve means and said support member temporarily attaching to said seat portion of said stadium type chair by sliding said flexible sleeve from front to back over said seat portion of said stadium type chair to position said seat portion between said flexible sleeve means and said support member;



said support member being formed of a resilient material and said flexible sleeve being formed of a flexible material, said flexible material attaching said resilient material with said flexible material flexing to mimic the contours of said seat;

movable shelf means for holding articles, said shelf means movably attached to said support member so as to move between an extended position wherein at least a portion of said shelf means extends beyond the front edge of said seat and a retracted position wherein said shelf means is located below the underside of said seat;

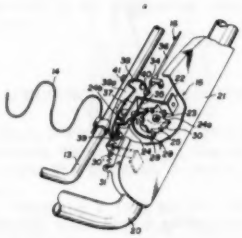
shelf attaching means located on said resilient support member for movably attaching said shelf means to said resilient support member.

4,556,251

LUMBAR SUPPORT DEVICE

Genziro Takagi, Akishima, Japan, assignor to Tachikawa Spring Co., Ltd., Japan

Filed Oct. 18, 1983, Ser. No. 543,006
Int. Cl.[4] A47C 3/00
U.S. Cl. 297—284 **5 Claims**



1. A lumbar support device for a vehicle seat back of the type having a pair of spaced-apart frame members, said lumbar support device comprising:

a lumbar support frame pivotally mounted between said pair of frame members for pivotal movements between lesser and greater positions to thereby exert lesser and greater pressures, respectively, against said vehicle seat back;

an idler arm member having one end pivotally mounted to one of said pair of frame members and another end operatively interengaged with said lumbar support frame and including means defining a bearing surface;

cam means having a cam shaft, said cam means defining a cam surface in bearing engagement with said bearing surface of said idler arm member, said cam means being rotatable about said cam shaft for causing said cam surface to pivotally displace said another end of said idler arm member which, in turn, pivotally moves said lumbar support frame between said lesser and greater positions; and

operation means for effecting selective rotation of said cam means to thereby permit selective adjustment of said lumbar support device between said lesser and greater positions, said operation means including;

(a) a ratchet wheel fixed to said cam shaft and defining a plurality of ratchet teeth,

(b) a rotary arm pivotally connected to said cam shaft;

(c) a feed click piece having one end pivotally mounted to said rotary arm and defining at the other end thereof an engagement surface engaged with a predetermined one of said ratchet teeth; and

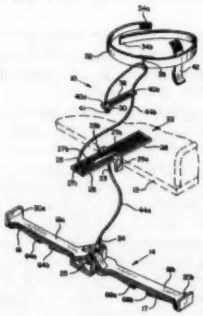
(d) operation lever means having a flexible wire connected to said rotary arm, said operation lever means for pivoting said rotary arm, and thus said feed click piece, in response to manipulation of said operation lever means to thereby rotate said ratchet, and thus said cam means, in said predetermined rotational direction by virtue of said engagement between said engagement surface and said predetermined one of said ratchet teeth whereby said lumbar support frame is pivotally moved between said lesser and greater positions to thereby adjust same.

4,556,252

PORTABLE SKI REST

Vern L. Serex, 5386 Aster St., NW., Salem, Oreg. 97034

Filed Feb. 14, 1983, Ser. No. 466,131
Int. Cl.[4] A47C 9/12
U.S. Cl. 297—438 **6 Claims**



1. A portable foot rest, for supporting the feet of a person while said person is seated on a ski lift and wearing skis, boots or the like, comprising:

(a) rigid elongate first support means for supporting said person's feet;

(b) second support means for supporting said first support means;

(c) elongate means for interconnecting said first support means and said second support means and for supporting said first support means in an operative position remote from and below said second support means; and

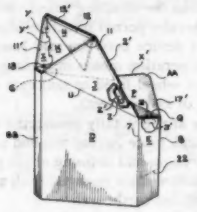
(d) said second support means including belt means for supportably encircling the waist of said person and, by means of support from said waist, supporting said first support means in said operative position while said person is seated on said ski lift.

4,556,253

DISPOSABLE CHAIR

Francois M. Geneve; Luc M. D. Heiligenstein, and Stephen B. Melamed, all of Chicago, Ill., assignors to Tres Design Co., Inc., Chicago, Ill.

Filed May 27, 1983, Ser. No. 498,749
Int. Cl.[4] A47C *4/00*
U.S. Cl. 297—440 **29 Claims**



1. A one-piece, die-cut, prescored blank for a disposable chair comprising:

(a) a generally rectangular sheet of lightweight material having a plurality of panels defined therein by prescored fold lines;

(b) a horizontal orientation being defined in respect to said blank considered in plan view to extend between a first end assembly flap margin and a second end rear margin, and a vertical orientation being defined to extend between a top and bottom margin, said first end assembly flap margin and said second end rear margin each being generally vertical;

(c) said blank having an assembly flap defined between said assembly flap margin and a first vertical score line horizontally spaced from and generally parallel to said assembly flap margin;

(d) a plurality of vertical score lines disposed medially between said first vertical score line and said second end margin;

(e) said vertical score lines being generally parallel to each other and said end margins, and horizontally spaced from each other to define in said blank at least four vertical sidewall base panels including:

(i) a rear right sidewall base panel;

(ii) a front right sidewall base panel;

(iii) a front left sidewall base panel; and

(iv) a rear left sidewall base panel;

(f) a set of continuous score lines joined end to end extending generally horizontally between said assembly flap score line to said second end margin in a pair of V portions forming a generally W-shaped configuration, said W score lines being disposed medially of said top and bottom margins to define in an upper portion of said blank between said W score lines and said top margin a pair of adjoining legrest and backrest panels, said W score lines defining a top edge of each of said vertical side base panels, said first of said pair of legrest and backrest panels being lower legrest and backrest panels, and said second of said pair being adapted to overlie said first as upper legrest and backrest panels;

(g) at least one pair of diagonal score lines, one each extending from the intersection of each V portion of said W score line to said top margin, said diagonal score lines being inclined at their tops toward each other to define in said upper blank portion a pair of generally mirror image legrest panels and backrest panels;

(h) said upper blank portion having a generally V-shaped relieved portion disposed medially of the first and second end margin extending downwardly from said top margin to intersect the central apex juncture of the two V portions of the W score line, said relieved portion providing upper margins for said legrest panels, and one of the generally mirror image legrest and backrest panels lying on each side of the V-shaped relieved portion;

(i) said legrest panels being defined, respectively, between said upper legrest panel margin, said diagonal score line and said W score line, and said backrest panels being defined, respectively, between said top margin, said W score line and said diagonal score line;

(j) individual ones of said vertical score lines intersecting the vertexes of said two V portions of said W score line, and the central apex juncture of said two V portions of said W score line, with the vertical score line intersecting said central apex defining a front fold line;

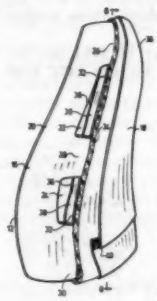
(k) said blank, upon folding said assembly flap along said front fold line to secure said assembly flap to the obverse side of said rear right side vertical sidewall base panel in position to lap said first vertical score line parallel to said second end rear margin, forms a lightweight disposable chair having parallel sides in a knocked-down condition which may be popped-open by separating the two sides of the folded blank and folding the sides at said vertical score lines to form a base, generally diamond-shaped in plan view cross-section, with a first, front apex formed of said front fold line, of vertical sidewalls, and the legrest and backrest of said chair being formed by folding the first, lower pair of said legrest and backrest panels along said V portion fold line downwardly into engagement with the uppermost edge of opposed sidewalls, and folding the second pair of said legrest and backrest panels downwardly to overlie said first, lower pair of legrest and backrest panels, said diagonal score lines flexing so that said legrest and backrest panels form in side view cross-section an ergonomically adequate support for a human user.

4,556,254

BACKREST

Frank L. Roberts, Thornhill, Canada, assignor to Bio-Support Industries Limited, Toronto, Canada

Continuation of Ser. No. 330,877, Dec. 15, 1981, abandoned. This application Nov. 2, 1984, Ser. No. 667,579
Int. Cl.[4] A47C *7/02*
U.S. Cl. 297—460 **10 Claims**



1. A backrest comprising a shell frame member having a central portion and opposed wing portions laterally projecting from said central portion, the lateral dimension of said wing portions increasing in a downward direction, said wing portions connecting only to said central portion, said central portion having in longitudinal section a lower convex section and an upper concave section with an area of inflexion therebetween, said frame member thereby exhibiting in medial longitudinal section a shallow S form, said shell frame member having in transverse section a shallow concave form, said shell frame member being constructed to be relatively stiff and inflexible along said longitudinal medial section and relatively

resilient in medial portions transverse thereto so as to tend to decrease the transverse concavity thereof under the influence of the weight of a user, and

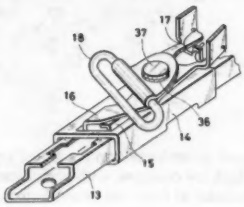
an upholstered finish comprising a cover stretched between lateral margins of said shell frame member to leave an air space between said shell frame member and said cover.

4,556,255

ANCHOR MOUNTING DEVICE

Osamu Kawai, Fujisawa, Japan, assignor to NSK-Warner K.K., Japan

Filed Jul. 6, 1983, Ser. No. 511,093
Claims priority, application Japan, Jul. 9, 1982, 57-104217[U]
Int. Cl.⁴ A62B *35/00*
U.S. Cl. 297—483 **10 Claims**



1. An anchor mounting device for a vehicle body, comprising:

an anchor plate which is displaceable in a direction of displacement;

a base adapted to be mounted on a vehicle body and having interlocking means which is formed of a plurality of interlocking portions provided along the direction of displacement of the anchor plate;

a slide member guided along the base and carrying the anchor plate thereon;

at least one latch piece supported pivotally on the slide member and displaceable between a first position where the latch piece is in engagement with the interlocking means and a second position where the latch piece is out of engagement with the interlocking means;

means kept in engagement with the latch piece to normally bias the latch piece toward the first position; and

an additional interlocking portion provided on the slide member and engagable with the latch piece only at the first position, and when a load has been applied to the anchor plate, capable of transmitting the load from the slide member to the interlocking means by way of the latch piece.

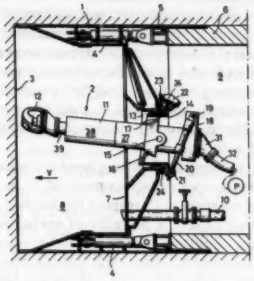
4,556,256

CUTTING APPLIANCES FOR USE IN TUNNEL DRIVING OPERATIONS

Hans G. Follert, Dortmund; Herbert Rzepka, Ascheberg, and Martin Schwert, Werne, all of Fed. Rep. of Germany, assignors to Gewerkschaft Eisenhutte Westfalia, Lunen, Fed. Rep. of Germany

Filed Aug. 1, 1983, Ser. No. 519,365
Claims priority, application Fed. Rep. of Germany, Aug. 5, 1982, 3229268
Int. Cl.⁴ E21D *9/08*
U.S. Cl. 299—33 **12 Claims**

12. A tunnel driving apparatus comprising: a shield, a bulkhead within the shield separating a front chamber adjacent a working face from a rear chamber, the working face being supportable by fluid passing into the front chamber, a cutting appliance for acting on said working face, said cutting appliance comprising an arm, means mounting the arm on the bulkhead for rotary and swinging motion, said mounting means also permitting longitudinal displacement of the arm, a cutter head at the end of the arm adjacent the working face, drive means for driving the cutter head, and conduit means for



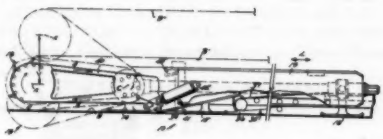
removing material from the front chamber by suction, wherein the drive means and the conduit means are both disposed within the arm.

4,556,257

HORIZONTAL EDNA MINER

James C. Justice, and Frank A. Delli-Gatti, Jr., both of Beckley, W. Va., assignors to Coaltex, Inc., Beckley, W. Va.

Filed Jul. 11, 1983, Ser. No. 512,712
Int. Cl.⁴ E21C *27/24*
U.S. Cl. 299—68 **6 Claims**



1. A mining machine for forming, and for use in, elongated generally horizontal bores in coal seams and the like, comprising:

a non-rotatable body member, with stabilizing means for insuring non-rotative movement of said body member in a bore;

a single cutting head mounted in front of said non-rotatable body member, and rotatable about a first axis;

means for rotating said cutting head about said first axis to effect cutting of coal or the like;

conveying means mounted behind said cutting head in operative association with said body member for conveying material cut by said cutting head away from the cutting site in substantially the dimension of elongation of said bore; said conveying means comprising an auger section operatively attached to each of said powered shafts; and scoop means positioned posteriorly of said auger sections and having a bottom portion substantially abutting the bore floor and then extending posteriorly therefrom at a positive angle, said scoop means operatively connected to said side wall supports;

means for pivoting said cutting head first axis about a generally horizontal second axis generally perpendicular to said bore dimension of elongation so that said first axis is movable from a first cutting position of said cutting head, substantially in line with said conveying means, to other cutting positions vertically displaced from said first cutting position;

means for sumping said body member and cutting head;

said non-rotatable body member comprising a pair of side wall supports;

said pivoting means including portions of each of said side wall supports which define pivot means, said pivot means defining said second axis, said second axis being parallel to said cutting head axis of rotation;

said means for pivoting said cutting head further comprising: a pair of support arms operatively connecting said cutting head and said pivot means, said support arms each extending generally parallel to said bore dimension of elongation when said cutting head is in said first position; and power means operatively connected to said arms and said side walls for effecting pivotal movement of said arms about said second axis; and

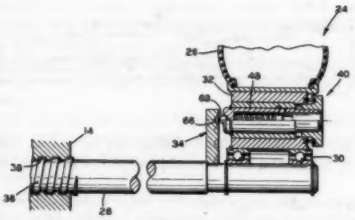
said means for rotating said cutting head comprising a pair of powered shafts operatively connected to said side wall supports for rotation with respect to said body member; a pair of cutting chains; a plurality of sprockets associated with said pair of cutting chains; means for interconnecting a sprocket associated with each cutting chain to a said powered shaft to thereby drive said cutting chain, and said cutting head; one of said cutting chains being mounted in operative association with each of said arms, on the opposite side of said arm as said cutting head; and said powered shafts elongated in the dimension of elongation of said bore and also operatively attached to said conveying means for powering of a part thereof.

4,556,258

AXLE CLUTCH ACTUATOR

Gunnar H. Janson, Dudley, Mass., assignor to Dana Corporation, Toledo, Ohio

Filed Oct. 13, 1983, Ser. No. 541,755
Int. Cl.⁴ B62D *27/06*; B62K *5/06*
U.S. Cl. 301—128 **12 Claims**



1. A device for selectively clutching a wheel to an axle of a vehicle for axial retraction and extension of said wheel and axle relative to said vehicle, the wheel including a hub rotatably secured on the axle, said axle including an axle flange, said device fixed to said hub for providing operative connection of said wheel with said axle flange, said device comprising:

(a) a housing disposed for affixation to said hub of said wheel, said housing including a detent,

(b) a coupling sleeve axially movable within said housing, said sleeve having a bore registrable with said detent,

(c) a spring loaded plunger having a cam disposed for axial movement within said coupling sleeve,

(d) a ball carried within said bore, and releasably urged into said detent by said cam of said plunger, said sleeve defining a transversely extending inboard end disposed for engaging the axle flange and thereby clutching said wheel while said ball is held in said detent by said plunger,

(e) an actuator plate affixed to the outboard end of said sleeve, said plate being disposed for effecting the retention of said ball in said detent,

(f) a release button affixed to the outboard end of said plunger, said button extending axially through said actuator plate, and

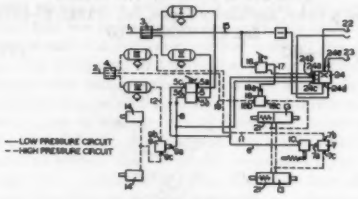
(g) spring means axially interposed between said actuator plate and said housing, said means operatively urging said plate away from said housing.

4,556,259

AIR BRAKE SYSTEM

Joachim Feldmann, Neustadt, and Wilhelm Schlamann, Isernhagen, both of Fed. Rep. of Germany, assignors to WABCO Westinghouse Fahrzeugbremsen, Hanover, Fed. Rep. of Germany

Filed Aug. 11, 1983, Ser. No. 522,124
Claims priority, application Fed. Rep. of Germany, Aug. 28, 1982, 3232127
Int. Cl.⁴ B60T *17/05*
U.S. Cl. 303—7 **8 Claims**



1. A compressed air brake system for motor vehicles having wheel brakes which are equipped with pneumatically-operable brakes which includes at least one control circuit and at least one operating circuit comprising:

(a) compressed air generating circuit including a first control circuit supplied with low pressure and a second operating circuit supplied with higher pressure,

(b) the low pressure in the control circuit is lower than the brake pressure in the operating circuit,

(c) a relay valve means separates the low pressure control circuit from the high pressure operating circuit,

(d) said relay valve means includes low pressure control connections which are acted upon by the low pressure control circuit and includes high pressure supply connections which are acted upon by the high pressure operating circuit, and high pressure brake connections for supplying the brake pressure into the high pressure operating circuit,

(e) a multi-stage protective valve means is interposed in the supply lines leading from the compressed air generating circuit to a plurality of storage tanks,

(f) the system includes front and rear operational brake circuits,

(g) a multi-stage brake valve for separating the control circuit,

(h) the multi-stage brake valve provides separate connections to selected ones of the plurality of storage tanks,

(i) the multi-stage brake valve controls the relay valve means associated with the operational brake circuits,

(j) the high pressure supply connections of the relay valve means are connected to selected others of the plurality of storage tanks, and

(k) the high pressure brake connections relay valve means are each connected to a respective wheel brake cylinder of divided vehicle axles.

4,556,260

APPARATUS FOR PREVENTING THE LOCKING OF A WHEEL

Toshifumi Maehara, Hanazono, Japan, assignor to Akebono Brake Industry Company Ltd., Tokyo, Japan

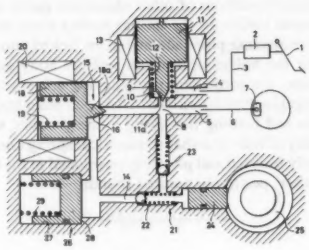
Filed Jul. 22, 1983, Ser. No. 516,279
Claims priority, application Japan, Aug. 17, 1982, 57-142353
Int. Cl.⁴ B60T *8/08*
U.S. Cl. 303—116 **1 Claim**

1. A wheel lock prevention apparatus comprising:

(a) a master cylinder;

(b) a brake unit for braking a wheel in response to actuation of said master cylinder;

(c) a main passage connected between said master cylinder and said brake unit for transmitting a brake fluid pressure;
(d) a first normally-open solenoid-operated valve disposed in said main passage which is independent of brake fluid pressure for operation;
(e) a reservoir mechanism including a movable reservoir piston for storing a brake fluid and urged in one direction by a spring force;
(f) a second normally-closed solenoid-operated valve having one end connected to said main passage between said brake unit and said first normally-open solenoid-operated valve and an opposite end connected to said reservoir mechanism;



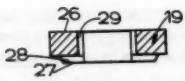
(g) a pump mechanism disposed between said reservoir mechanism and said brake unit for returning the brake fluid from said reservoir mechanism to said brake unit;
(h) means for opening said second normally-closed solenoid-operated valve in response to a first signal indicative of detected wheel locking;
(i) means for generating a second signal indicative of movement of said reservoir piston for storing brake fluid; and
(j) an electric circuit for actuating said pump mechanism when said first signal is not produced and said second signal is generated.

4,556,261

HYDRAULIC ANTI-SKID BRAKING SYSTEMS FOR VEHICLES

Glyn P. R. Farr, Warwickshire, England, assignor to Lucas Industries Public Limited Company, Birmingham, England

Filed Oct. 17, 1983, Ser. No. 542,358
Claims priority, application United Kingdom, Oct. 21, 1982, 8230101; Jan. 28, 1983, 8302460
Int. Cl.[4] B60T *8/02*
U.S. Cl. 303—116 **14 Claims**



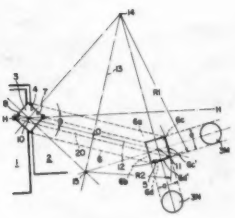
1. An hydraulic anti-skid braking system for vehicles comprising a brake for braking a wheel, a supply of operating fluid to apply said brake, a reservoir for fluid, skid sensing means for sensing the behaviour of said wheel and adapted to emit skid signals when said wheel attains a skid condition, said skid signals being electrical in nature, a solenoid-operated valve responsive to said skid signals and adapted to modulate the operating fluid from said supply to said brake in accordance with said skid signals, and an hydraulic pump incorporating at least one plunger working in a bore, and means defining a working chamber from which re-application fluid under pressure is supplied to said brake to control re-application of said brake following skid correction, said valve assembly incorporating an isolating valve disposed between said supply and said brake, a dump valve disposed between said brake and said reservoir, a coil energised in response to said skid signals, an armature surrounded by said coil, and a first spring biassing said armature in a first direction opposite a second direction in which said armature is moved when said coil is energised, wherein said dump valve comprises a first seating, and a first valve member for engagement with said first seating and urged towards said first seating by the force in said first spring acting through said armature, and wherein said isolating valve comprises a second seating spaced from said first seating, a second valve member for engagement with said second seating, and a second spring for urging said second valve member into engagement with said second seating, thrust transmitting means including a yieldable strut being disposed between said first and second valve members and through which a force from said first spring urging said first valve member into engagement with said first seating is transmitted to said second valve member to hold said second valve member away from said second seating, energisation of said coil moving said armature in said second direction against the force in said first spring to permit said first valve member to move away fron said first seating and open said dump valve and permit said second valve member to engage with said second seating under the force in said second spring and close said isolating valve, said yieldable strut yielding to permit said first valve member to move relative to said second valve member and close said dump valve when said coil is de-energised and said first spring urges said first valve member into engagement with said first seating, said isolating valve remaining closed until a pressure differential acting on opposite sides of said second valve member together with the force in said yielding strut exceeds the load in said second spring.

4,556,262

DIRECTION CHANGING PATH OF A ROLLER BEARING FOR AN ENDLESS LINEAR MOTION

Toshiaki Geka, Funabashi, Japan, assignor to Nippon Thompson Co, Ltd., Tokyo, Japan

Filed Nov. 18, 1983, Ser. No. 553,308
Claims priority, application Japan, Feb. 15, 1983, 58-20371[U]
Int. Cl.[4] F16C *29/06*
U.S. Cl. 308—6 C **10 Claims**



1. A direction changing path of a roller bearing for an endless linear motion wherein a casing mounted on a linear track rail makes an endless linear motion through a plurality of rollers circulating endlessly, characterized in that said direction changing path is provided in the casing and is of a semicircular shape connecting both ends of each of a load track and a return hole for allowing a smooth direction changing motion of the rollers, in that the cross section of said direction changing path is approximately square in shape and in that, among the four side wall surfaces forming said direction changing path, the radially outer two adjacent wall surfaces each have an outwardly bulging spherical surface, the center of curvature of each of said adjacent outwardly bulging spherical surfaces being located at the point of intersection of the extensions of the longitudinal axes of two rollers when located at the two extremities of the said direction changing path with the longitudinal axes thereof extending in the same general direction.

4,556,263

SLIDE MECHANISM, IN PARTICULAR FOR AN AUTOMOBILE VEHICLE SEAT

Claude Chevalier, Sully sur Loire, France, assignor to Compagnie Industrielle de Mechanismes en Abrege C.I.M., France

Filed Mar. 21, 1983, Ser. No. 477,109
Claims priority, application France, Mar. 31, 1982, 82 05518
Int. Cl.⁴ F16C *29/04*
U.S. Cl. 308—6 R **7 Claims**

1. A slide mechanism comprising:

(a) a pair of generally "U"-shaped slides arranged in sliding, head-to-toe relationship, flanges on each of the slides defining a track between their confronting surfaces;

(b) at least one pair of abutments formed on each flange and extending into the track;

(c) at least one pair of ball elements located in each track to facilitate relative sliding of the "U"-shaped slides; and,

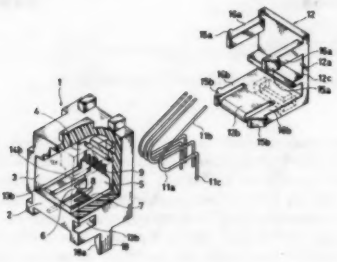
(d) elastically compressible means disposed in the track in contact with and between the at least one pair of ball elements, the compressible means being compressible when acted on by forces in a direction generally parallel to the direction of relative sliding between the two "U"-shaped members.

4,556,264

TELEPHONE CONNECTOR

Masanori Tanaka, Osaka, Japan, assignor to Hosiden Electronics Co., Ltd., Japan

Filed Mar. 8, 1984, Ser. No. 587,365
Claims priority, application Japan, Mar. 15, 1983, 58-37900[U]; Jun. 25, 1983, 58-98292[U]
Int. Cl.⁴ H01R *9/09, 13/447, 13/514;* H02B *1/02*
U.S. Cl. 339—17 LC **6 Claims**



1. A telephone connector, comprising:

a box-shaped body, the body having front, rear and bottom walls, the front wall having a plug inlet formed therein for receiving a comb-tooth shaped plug along an insertion axis and the rear and bottom walls having a holder mounting opening formed therein communicating with the plug inlet, the holder mounting opening defining a rear edge of the bottom wall and a lower edge of the rear wall;

a plurality of terminal lead-in grooves through the bottom wall, open at the rear edge thereof and running forwardly, parallel to the insertion axis at predetermined spaced intervals from one another;

upwardly opening, lower holding grooves in the bottom wall forming forward extensions of the terminal lead-in grooves;

a plurality of upper holding grooves through the rear wall, open at the lower edge thereof and in alignment with the terminal lead-in grooves and the lower holding grooves formed in the bottom wall;

pre-shaped, electrically conductive springs, each having a U-shaped main body with first and second free ends, the main body of each of the springs being received into one of the lower holding grooves, the first free end being formed by an unbent extension of the U-shape disposed in a corresponding upper holding groove and forming a conductive portion for contact with an electrode of the plug, the second free end being formed by a bent extension of the U-shape extending downwardly through the corresponding lead-in groove through the bottom wall and forming a connection terminal portion for contact with conductive portions of other electronic parts; and,

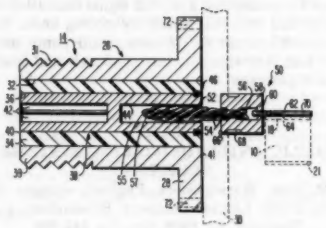
an L-shaped holder for the springs having a rear side portion and a projecting piece adapted to be locked into a position closing the holder opening to seal the body against dust intrusion, the projecting piece having a free edge pressably engaging the interiors of U-shaped main bodies of the springs and holding the spring in the grooves, whereby a plurality of fully pre-shaped electrical spring contacts may be easily inserted and precisely positioned in the body, and thereafter, positively secured therein.

4,556,265

RF COAXIAL-STRIP LINE CONNECTOR

Thomas J. Cunningham, Philadelphia, Pa., assignor to RCA Corporation, Princeton, N.J.

Filed Jun. 29, 1981, Ser. No. 278,453
Int. Cl.⁴ H01R *17/04*
U.S. Cl. 339—17 LC **5 Claims**



1. A coaxial RF connector for connecting a coaxial cable to a plane circuit having a plane conductor, said connector comprising:

a metal housing having a bore extending therethrough in a given direction, said housing including means for securing it in a fixed spaced relation to said plane circuit and to said cable;

a dielectric member within said housing bore having a bore extending therethrough in said given direction;

an electrically conductive interconnect conductor element within said dielectric member bore;

an electrically conductive flexible element which is sufficiently flexible in any radial direction normal to said given direction to so that one portion can move out of alignment with respect to a second portion spaced from the one portion in said given direction and located within said interconnect conductor element without signifcant bending stress within said flexible element, said flexible element being electrically connected to said interconnect conductor element at said second portion; and

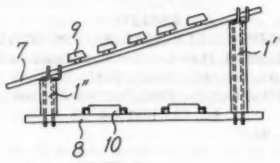
a conductor electrically conductively coupled to said one portion of the flexible element and adapted for connection to said plane conductor.

4,556,266

JUMPER WIRE MATERIAL

Toshimitsu Sonobe, Tokyo, Japan, assignor to Thomas & Betts Corporation, Raritan, N.J.

Filed Feb. 9, 1984, Ser. No. 578,712
Claims priority, application Japan, Feb. 9, 1983, 58-16808[U]
Int. Cl.⁴ H01R *11/00*
U.S. Cl. 339—29 R **6 Claims**



1. A jumper wire material comprising a plurality of elongate core wires, each being transversely spaced apart from the other by a predetermined pitch, and an insulative covering embedding said core wires therein, said insulative covering being solid and non-flexible, and having a plurality of ridges projectively provided in parallel with each other on a pair of mutually opposed side surfaces of said insulative covering, and extending longitudinally along said core wires, said covering having end surfaces at the longitudinal ends thereof for supporting electrical members to be electrically connected to said core wires.

4,556,267

INTEGRATED CIRCUIT MOUNTING SOCKET

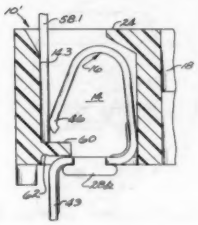
Ronald E. Senor, North Attleboro, Mass., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 8, 1983, Ser. No. 559,596
Int. Cl.⁴ H01R *13/422*
U.S. Cl. 339—59 M **3 Claims**

1. A connector for mounting integrated circuit units on a printed circuit board comprising a body of substantially rigid electrically insulating material having a plurality of recesses arranged in a line therein and a plurality of electrically conductive metal spring contact members mounted in the respective recesses, the body having the recesses open at one end at a bottom of the body,

and having terminal entry apertures opening into the opposite ends of the recesses through a top of the body, the contact members each having a horizontally extending base and a single beam spring part extending up into the recess from one end of the base to loop over the base to resiliently engage a distal end of the spring part with a first wall of the recess, and having a post part extending down out of the open recess end at the bottom of the body and from the opposite end of the base part,

a stop member integrally formed with the body at the bottom projecting from the first wall into the recess a selected distance forming a flat surface extending generally 90° from the first wall, the stop member being located between said distal end of the spring part and said base and



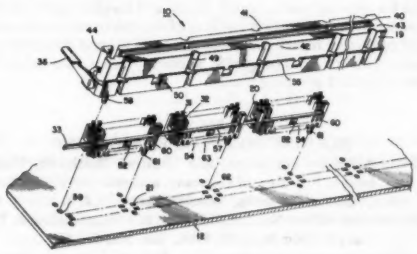
having a distal free end portion which is movable from an original position toward the top of the body to facilitate upward insertion of the contact members into the recess to a seated position, the distal free end portion adapted to move back to its original position once the contact member is seated within the recess, the stop member located to engagingly block excessive downward movement of i.c. unit terminals received through the terminal entry apertures.

4,556,268

CIRCUIT BOARD CONNECTOR SYSTEM HAVING INDEPENDENT CONTACT SEGMENTS

Rocco J. Noschese, Wilton, Conn., assignor to Burndy Corporation, Norwalk, Conn.

Continuation of Ser. No. 554,663, Nov. 23, 1983, abandoned. This application Jun. 20, 1985, Ser. No. 746,926
Int. Cl.⁴ H01R *9/09*
U.S. Cl. 339—74 R **14 Claims**



1. An electrical connector system comprising:

(a) an electrical connector receptacle, said receptacle including:

(b) a body shell member;

(c) a plurality of independent segments having multiple electrical contacts;

(d) means for supporting said segments in an independently floating arrangement within said body shell member providing a limited degree of freedom at positioning of said segments relative to said body shell member both vertically and from side to side and back to back; and

(e) alignment means supported by each of said segments for independently aligning said segments on a first circuit board so that a first portion of said electrical contacts engage desired contacts of said first circuit board.

4,556,269

HOLDER FOR ELECTRONIC COMPONENTS

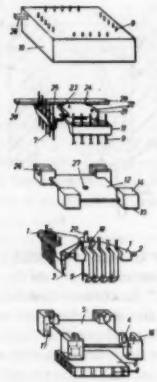
Folke O. A. Andersson, Tyresö, and Hakan A. Larsson, Märsta, both of Sweden, assignors to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

Filed Dec. 21, 1983, Ser. No. 564,070

Claims priority, application Sweden, Dec. 29, 1982, 8207492

Int. Cl.⁴ H01R *13/631*

U.S. Cl. 339—75 M **11 Claims**



1. A holder for connecting electrical contact pins to spaced contact surfaces on side surfaces of an electric component on a circuit board, said holder comprising a casing, gripping means having gripping surfaces for gripping the side surfaces of the electronic component between the electrical contact surfaces thereon, said gripping means being movable from an inoperative rest position to an operative engagement position in which said gripping surfaces come into contact with said side surfaces of the electronic component, electrical contact pins supported by said casing in normally spaced relation with said contact surfaces of said component, actuator means engaging said pins for bringing said pins into operative electrical contact with said contact surfaces of the electronic component, and operating means for moving said gripping means to its operative position and for moving said actuator means and thereby said pins into contact with said contact surfaces of the electronic component, said operating means including first and second rotatable elements one for operating said actuator means, the other for operating said gripping means.

4,556,270

HOUSING FOR PLUG CONNECTOR

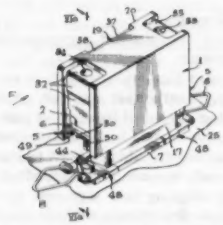
Günter Schütz, Heilbronn, and Manfred Reichardt, Weinsberg, both of Fed. Rep. of Germany, assignors to Allied Corporation, Morris Township, Morris County, N.J.

Continuation of Ser. No. 318,882, Nov. 6, 1981, abandoned. This application Aug. 27, 1984, Ser. No. 644,159

Claims priority, application Fed. Rep. of Germany, Nov. 6, 1980, 3041938

Int. Cl.⁴ H01R *13/629*

U.S. Cl. 339—91 R **7 Claims**



1. A connector assembly for mating a plug connector with a matching connector, said assembly comprising a one-piece housing and a plug connector mounted in said housing and extending in a connector extending direction, said housing having a generally block shape defined by top and bottom walls, a back portion joining said walls, and two narrow side walls extending forwardly between said top and bottom walls from said back portion to an open front portion; said housing including a laterally extending slot adjacent the intersection of one of said top and bottom walls with said back portion;

said housing including aperture means on said back portion adjacent said side walls and extending to said front portion and adapted to receive fastening screws to fasten said housing to said matching connector;

said side walls having receiving means adapted to receive a detachable catch part for lockingly receiving wire strap means mountable on said matching connector for fastening said plug connector to said matching connector;

said housing adapted to receive a detachable mounting block at said front portion thereof adjacent said side walls, said mounting block having catch projection means for receiving detachable catch element means mountable on said housing for fastening said plug connector to said matching connector;

flat electrical cable extending through said slot in said housing and being connected to said plug connector; and

means associated with said plug connector for leading said flat cable out of said housing in either of two directions, the first of said directions being opposite to said connector extending direction and the second of said directions being at right angles to said connector extending direction.

4,556,271

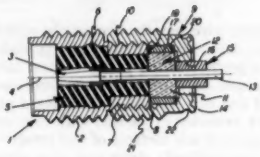
HERMETICALLY SEALED CONNECTOR

George M. Hubbard, Hamden, Conn., assignor to M/A-COM Omni Spectra, Inc., Merrimack, N.H.

Filed Oct. 14, 1983, Ser. No. 542,106

Int. Cl.⁴ H01R *4/00*

U.S. Cl. 339—94 C **12 Claims**



1. A hermetically sealed connector, suitable for use in the construction of a launcher for the transfer of energy from a coaxial cable to an integrated circuit, comprising an annular body defining a bore in which is disposed an annular insulator which in turn supports a central electrical contact, said body defining an external thread of relatively large diameter adapted for the connection of a coaxial connector thereto with a central contact of the connector in communication with the central contact, and having an annular extension defining a thread of relatively small diameter; and

an annular header defining a thread by which the header is connected to the body extension and a thread of relatively large diameter by which the header may be attached to a structure;

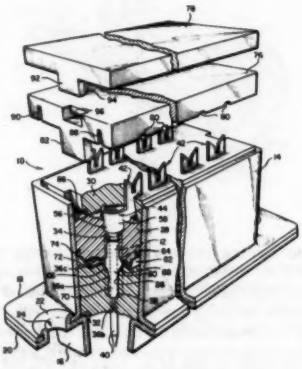
wherein said relatively large diameter thread of said header and said relatively small diameter thread have pitches whereby the relatively small diameter threads will untighten upon the application of an undoing torque to the body while the relatively large diameter thread when interconnecting the header to said structure remains tight without an external restraining torque applied to the header to prevent its untightening.

4,556,272

FLAT CABLE CONNECTOR

Francisco R. Briones, Markham, Canada, assignor to Allied Corporation, Morris Township, Morris County, N.J.

Filed Oct. 7, 1981, Ser. No. 309,546
Int. Cl.[4] H01R *4/24*
U.S. Cl. 339—99 R **9 Claims**



1. A connector for making electrical contact with each of a plurality of parallel conductors spaced from each other by a first predetermined distance comprising:

a plurality of substantially identical contacts, each comprising a conductor terminating end adapted for making electrical connection with one of said conductors, a contact mating end and a deformable intermediate portion connecting said conductor terminating end and said contact mating end;

a shell;

at least one dielectric insert housed within said shell and having bores holding said contacts, said contact mating ends being held by said bores in a row and spaced from each other by a second predetermined distance different than said first predetermined distance, said dielectric insert further having slots for receiving said deformable intermediate portions of said contacts and positioning said contacts such that said conductor terminating ends are disposed in a row and spaced from each other by said first predetermined distance; and

a rear dielectric insert having a plurality of tapered contact forming apertures aligned in a row, said rear dielectric insert being installable on said connector with one side thereof disposed adjacent said one dielectric insert such that the conductor terminating end of each of said contacts is guided through a respective one of said contact forming apertures to deform the intermediate portions of at least some of said plurality of contacts and align said conductor terminating ends in a row and spaced from each other by said first predetermined distance.

4,556,273

ELECTRICAL WIRING DEVICE WITH CORD GRIP FINGERS HAVING LONGITUDINAL FLEX JOINTS

Albert A. Pudims, Stratford, Conn., assignor to Westinghouse Electric Corp., Pitsbugh, Pa.

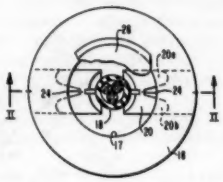
Filed Jul. 16, 1984, Ser. No. 631,356
Int. Cl.[4] H01R *13/58*
U.S. Cl. 339—103 M **6 Claims**

1. An electrical wiring device comprising: an insulating body with a plurality of electrical contact elements supported therein and terminal means for attaching conductors respectively thereto;

an insulating cover disposed over said body and having an aperture accommodating an electrical line cord containing conductors attached to said terminal means of said body;

a plurality of grip fingers each joined together at a flexible joint proximate the outer portion of said body for permitting movement of a main finger portion radially inward;

fastener means for longitudinally drawing said cover toward



said body with an inner surface of said cover bearing against said fingers to force them into engagement with and restrict the movement of a line cord;

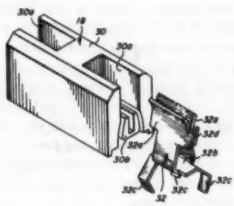
said grip fingers each having a longitudinal hinge with a portion on each side thereof permitting circumferential spreading of said portions around the cord under the force of said cover bearing thereagainst.

4,556,274

FUSE AND MOUNTING ARRANGEMENT FOR PRINTED CIRCUIT BOARD APPLICATION

Raul Olivera, Hoffman Estates, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 21, 1983, Ser. No. 564,041
Int. Cl.[4] H01R *11/22*
U.S. Cl. 339—147 R **5 Claims**



1. An improved miniature fuse device and mounting arrangement adapted for use on a printed circuit board, comprising on combination:

a holder of rigid, non-conductive material having cavities at respective ends thereof each being open at its respective top, bottom and end sidewall, said holder further having an arm within each of said cavities extending laterally to a position adjacent its respective open end sidewall;

first and second end terminals of conductor material which are each slid through a respective one of said open end sidewalls and around a respective one of said lateral arms for retention in the interior of said holder on said laterally extending arms in said respective cavities, said end terminals having leg portions extending through said open bottom for mounting to the printed circuit board; and

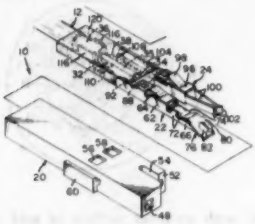
a fuse block of transmparent non-conductive material having a pair of spaced apart partially embedded blades extending downwardly therefrom together with a fuse link of the desired current carrying capacity electrically bridged across said blades within said fuse block,

said blades being adapted for releasably inserting into and being retained by friction fit within said respective end terminals in said fuse holder.

4,556,275
ELECTRICAL PANELBOARD CONNECTOR

Wilbur A. Hamsher, Jr., New Cumberland, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Continuation-in-part of Ser. No. 506,964, Jun. 23, 1983, Pat. No. 4,491,381. This application Aug. 15, 1983, Ser. No. 523,202
Int. Cl.[4] H01R *13/58*
U.S. Cl. 339—218 M 10 Claims



1. An electrical connector for terminating signal and ground conductor means of a trilead cable means and electrically connecting the signal and ground conductor means respectively to a pin terminal and a ground rail of a panelboard, comprising:

dielectric housing means having parallel passageway means and another passageway means extending therethrough, said parallel passageway means communicating with said other passageway means and respective opening means at a front end of said housing means into which the pin terminal and ground rail extend;

signal terminal means disposed in one of said parallel passageway means and including contact means and termination means, said contact means being in alignment with one of said opening means for electrical connection with the pin terminal, said termination means extending along said other passageway means of said housing means and being terminated to the signal conductor means;

ground terminal means disposed in the other of said parallel passageway means and including contact member means and termination member means, said contact member means being in alignment with the other of said opening means for electrical connection with the ground rail, said termination member means extending along said other passageway means of said housing means insulated from said signal terminal means and being terminated to the ground conductor means;

one of said signal terminal means and said ground terminal means having cable securing means engaging the cable means thereby securing the cable means thereto and providing a cable strain relief;

terminal securing means on said signal terminal means and said ground terminal means and said housing means securing said terminal means in said housing means;

latching means on said signal terminal means which latchably engages the pin terminal when electrically connected therewith;

means in said passageway means containing said signal terminal means engageable with said latching means when said housing means is moved axially relative to said signal terminal means thereby causing said latching means to be unlatched from the pin terminal enabling the connector to be disconnected from the pin terminal and the ground rail; and

profiled dielectric cover means extending along said other passageway means of said housing means and encapsulating said termination means and said termination member means and engaging a section of the cable means secured in said cable securing means thereby sealing said terminating means and said termination member means and providing additional cable strain relief.

4,556,276
SOLDER BEAMS LEADS

Hazen Curtis, III, Andover, Mass., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed May 6, 1983, Ser. No. 492,213
Int. Cl.[4] H01R *4/02, 11/22*
U.S. Cl. 339—258 R 6 Claims

1. a solder-bearing terminal of the type having a clip and a stem formed by a flat metal strip, the clip having first and second opposing resilient clamping fingers spaced from each other to form a receiving gap opening for the edge of a circuit substrate to be connected to the terminal, the free end portions of the fingers being arcuately curved outward, away from each other, and the stem extending from the clip with a pin section suited for connection to a circuit board,

the first finger is formed by a section of the strip which is folded back on itself so that the first finger of the clip is at least twice the thickness of the strip, the folded back strip portion of said first finger being bent around the bottom of the clip to extend as a stem from below the bottom of, and in a direction generally parallel to, the second finger, and

the second finger includes an end portion which is arcuately reverse curved from the free end to form a clamp for holding a piece of solder, the end portion of the second finger comprising a centrally disposed slot which extends from that portion of the free end closest to the first finger around the free end portion.

4,556,277
TRANSPARENT HEAT-MIRROR

John C. C. Fan, Chestnut Hill, and Frank J. Bachner, Newton, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

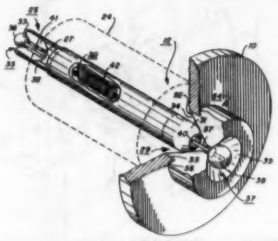
Continuation of Ser. No. 690,696, May 27, 1976, Pat. No. 4,337,990, which is a continuation-in-part of Ser. No. 498,160, Aug. 16, 1974, abandoned. This application Apr. 5, 1982, Ser. No. 365,533
The portion of the term of this patent subsequent to Jul. 6, 1999, has been disclaimed.
Int. Cl.[4] G02B *5/28*
U.S. Cl. 350—1.7 3 Claims

1. A composite film comprising a continuous, discrete, silver layer sandwiched between two continuous and discrete layers of titanium dioxide each having a thickness of greater than about 150 Å, said silver and titanium dioxide layers having thicknesses that cooperate to provide said composite film with significantly higher solar energy transmission compared to said silver layer alone and having high infrared reflectively.

4,556,278
HOLOGRAPHIC DISC MOUNT

Richard P. Schell, Ontario, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Feb. 21, 1984, Ser. No. 582,107
Int. Cl.[4] G02B 5/32
U.S. Cl. 350—3.71 8 Claims



1. A free floating mount for supporting a scanner holographic disc on a motor shaft which takes maximum advantage of the self compensating tendency of the disc to bring itself into perpendicular relationship with the shaft axis and eliminate wobble, comprising:

(a) first self aligning coupling means for supporting said disc at one end of said motor shaft;

(b) cable means passing through coaxial bores in said disc and said motor shaft, said cable means having first and second cables and bias means connecting said first and second cables together end to end;

(c) second self aligning coupling means for connecting one end of said first cable with said disc; and

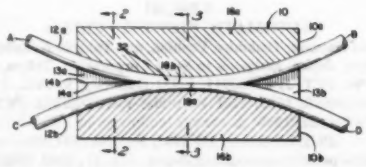
(d) third self aligning coupling means for connecting one end of said second cable with said motor shaft;

said bias means cooperating with said first and second cables to cause said second and third coupling means to draw said disc and said shaft into frictional driving contact with one another through said first coupling means while permitting centrifugal force generated during rotation of said disc to adjust the angular relationship between said disc and said motor shaft as required to prevent disc wobble and maintain the plane of rotation of said disc perpendicular to the axis of rotation of said shaft while maintaining frictional driving contact therebetween.

4,556,279
PASSIVE FIBER OPTIC MULTIPLEXER

Herbert J. Shaw, Stanford, and Michel J. F. Digonnet, Menlo Park, both of Calif., assignors to Board of Trustees of the Leland Stanford Junior University, Stanford, Calif.

Filed Nov. 9, 1981, Ser. No. 319,301
Int. Cl.[4] G02B 5/172
U.S. Cl. 350—96.15 29 Claims



16. A fiber optic coupler, comprising;

a pair of optical fibers, each having fiber optic material removed from one side thereof, to form a flat, oval cladding surface;

means for positioning said pair of fibers to juxtapose said flat, oval cladding surfaces in facing overlappingly relationship to form a region of interaction for coupling light between the cores of said fibers, said interaction region having an interaction length which is substantially an odd multiple of a coupling length of a first selected optical wavelength and which is substantially an even multiple of a coupling length of a second selected optical wavelength; and

means for relatively laterally displacing said flat oval cladding surfaces to change the degree of overlap of said flat, oval cladding surfaces to change the coupling at said interaction region such that said interaction length is an odd multiple of a coupling length of a third selected wavelength and an even multiple of a coupling length of a fourth selected wavelength.

29. A method of manufacturing a fiber optic multiplexer for combining or separating light signals of first and second wavelengths, comprising:

arcuately mounting a pair of fibers along a radius of curvature, each of said fibers having an inner core surrounded by an outer cladding;

constructing a coupler from said arcuately mounted fibers by:

removing cladding from each of said arcuately mounted fibers to provide respective planar surfaces on one side thereof, the cladding removal accomplished with reference to the wavelengths to provide a core spacing between said fibers, when said planar surfaces are juxtaposed, which yields a substantial difference in the ratio of the effective interaction length to the coupling length for the wavelengths;

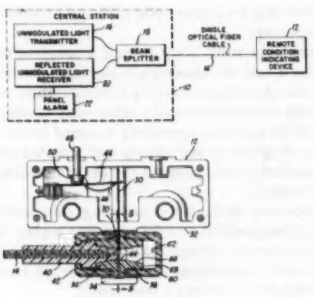
juxtaposing said planar surfaces to form a planar interface between said fibers, the cores of said fibers on opposite sides of said planar interface; and

relatively moving said planar surfaces along the planar interface, without changing the proximity of the cores to said planar interface, until the interaction length is substantially an odd multiple of a coupling length of said first wavelength and is substantially an even multiple of a coupling length of said second wavelength.

4,556,280
SINGLE CABLE OPTICAL FIBRE SIGNALING SYSTEM

Robert J. Bagby, Evanston, Ill., assignor to United States Riley Corporation, Skokie, Ill.

Filed Sep. 13, 1983, Ser. No. 531,933
Int. Cl.[4] G02B 5/14
U.S. Cl. 350—96.16 20 Claims



1. An annunciator system for developing an indication at an annunciator station in response to a control signal produced at a remote location comprising, a single optical fibre cable interconnecting said annunciator station and said remote location, a source of unmodulated light at said annunciator station, bidirectional coupling means connected between said light source and one end of said cable at said annunciator station, a shutter

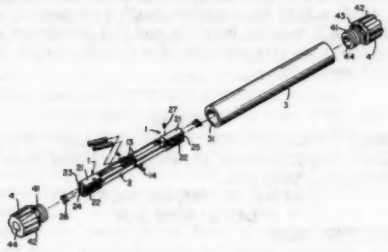
element at said remote location and movable between first and second positions in response to said control signal, means for terminating the other end of said cable in cooperating relation to said movable shutter element, means effective in one position of said shutter element to absorb unmodulated light transmitted from said source over said cable to said remote location and prevent the same from being transmitted back over said cable to said bidirectional coupling means, means effective in the other position of said shutter element to reflect unmodulated light transmitted to said remote location back over said cable to said bidirectional coupling means, and annunciator means connected to said bidirectional coupling means at said annunciator station and responsive to reflected unmodulated light transmitted back over said cable when said shutter element is in said other position for developing an annunciator control signal.

4,556,281

END PLUG FOR A FIBER OPTIC IN-LINE SPLICE CASE ASSEMBLY

John J. Anderton, Oil City, Pa., assignor to GTE Products Corporation, Stamford, Conn.

Filed Dec. 19, 1983, Ser. No. 562,929
Int. Cl.[4] G02B 7/26
U.S. Cl. 350—96.20 **1 Claim**



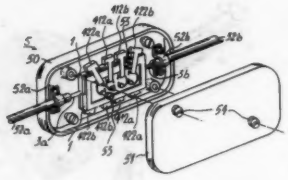
1. An end plug for a fiber optic splice case assembly, said end plug comprising:
- a substantially solid body having a longitudinal axis and having a pair of diametrically opposed rounded surfaces, said rounded surfaces having a configuration matching the internal circumference of a splice case housing;
- a pair of flat surfaces, oppositely disposed from one another and orthogonal to and joining said rounded surfaces, said flat surfaces being adapted for the connection of torque bars thereto;
- a first aperture through said end plug, substantially parallel to said longitudinal axis for receiving a glass fiber;
- a second aperture through said end plug, substantially parallel to said longitudinal axis and displaced from said first aperture, for receiving a fiber wand;
- a cutout portion in an end surface of said end plug, said cutout portion being formed to receive a protective layer dressed away from an optical fiber;
- a threaded bore in a rounded surface of said end plug extending radially toward and communicating with said second aperture; and
- a setscrew threaded into said bore for securing said fiber wand in said second aperture.

4,556,282

DEVICE FOR CONNECTING OPTICAL FIBERS

Robert P. Delebecque, 156 bis, rue d'Aulnay, 92290 Chatenay Malabry, France

Filed Sep. 14, 1983, Ser. No. 532,108
Claims priority, application France, Sep. 17, 1982, 82 15691
Int. Cl.[4] G02B 7/26
U.S. Cl. 350—96.21 **38 Claims**



17. A housing for connecting two optical fibers, said housing comprising:
- a flat holder having a longitudinal edge defining an alignment direction of said fibers, said longitudinal edge including a central alignment groove for receiving, aligning and joining endface-to-endface end portions of said two fibers, and two surfaces on either side of said alignment groove for bearing the claddings of said two fibers,
- two parallel flat cover plates having lower inner side portions embracing two major sides of said flat holder,
- two first means for pressing said two fiber end portions into said alignment groove respectively, said two first pressing means being slidably mounted between upper portions of said inner sides of said cover plates and being pulled to said alignment groove by two first spring means respectively, and
- two second means for pressing said fiber claddings onto said two bearing surfaces respectively, said two second pressing means being slidably mounted between said upper portions of said inner sides of said cover plates and being pulled to said bearing surfaces by two second spring means respectively.

4,556,283

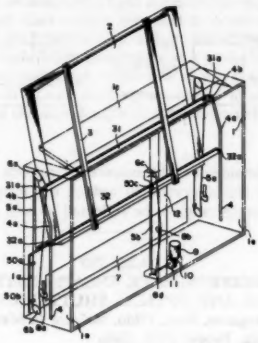
AUTOMATIC VIEWING SCREEN

Kiyoshi Numata; Toshihiro Yoshida, and Takashi Kokubo, all of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

PCT No. PCT/JP83/00011, § 371 Date Sep. 9, 1983, § 102(e) Date Sep. 9, 1983, PCT Pub. No. WO83/02503, PCT Pub. Date Jul. 21, 1983
PCT Filed Jan. 11, 1983, Ser. No. 537,398
Claims priority, application Japan, Jan. 11, 1982, 57-2012[U]
Int. Cl.[4] G03B 21/56, 21/10, 21/30
U.S. Cl. 350—117 **6 Claims**

1. A disappearing viewing mechanism comprising an upright viewing screen, a cabinet enclosing said screen, an opening in an upper portion of said cabinet, a closure for said opening, conveyor means operating to convey said upright screen upwardly of said cabinet and into view above said cabinet and

said opening, and means interconnecting said closure and said screen simultaneously moving said closure into open condition



and said screen into its upper viewing position, or the reverse thereof.

4,556,284

APPARATUS FOR COMBINING AN OPTICAL AND LASER SYSTEM AND INCLUDING A SELF-FOCUSSING OPTICAL FIBER BUNDLE

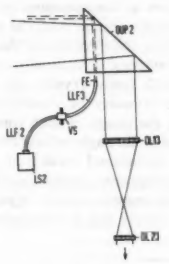
Otto Albersdoerfer, Feldafing; Heinz Blankenfeld, Germering; Wolfgang Kranz, and Wolfgang Weckwerth, both of Munich, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Division of Ser. No. 320,949, Nov. 13, 1981, abandoned. This application May 22, 1984, Ser. No. 577,294

Claims priority, application Fed. Rep. of Germany, Dec. 19, 1980, 3047958

Int. Cl.⁴ G02B *27/10, 5/16*

U.S. Cl. 350—174 **3 Claims**



1. A directional and observation means for a weapons systems, consisting of an optical system in which a prism of the lens system is also utilized for a laser transmitter and the laser transmitter being disposed outside the optical path of said optical system, and an optical fiber for transmitting the laser radiation to the optical system, one end of said optical fiber connected to a surface of the laser transmitter which emits laser radiation, and the other end of said optical fiber is an emission surface, and including a self-focusing optical fiber bundle mounted between said other end of said optical fiber bundle and said inclination prism.

4,556,285

REFLECTION MIRROR FOR OPTICAL INSTRUMENT

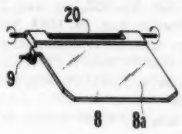
Yoji Sugiura; Hironori Yamamoto; Keijiro Nishida, all of Kanagawa; Naoki Shirai, Saitama; Kimio Takahashi, Tokyo; Mikio Nakasugi, Tokyo, and Norihisa Saito, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 344,004, Jan. 29, 1982, abandoned. This application Mar. 19, 1984, Ser. No. 591,233

Claims priority, application Japan, Feb. 12, 1981, 56-19505

Int. Cl.⁴ G02B *5/08, 7/18*

U.S. Cl. 350—600 **4 Claims**



1. A swinging reflective mirror for a camera comprising a mirror member consisting essentially of non-ferrous metallic material having a flat plate-like shape forming a planar flat part, a shaft supporting part which axially supports said planar plate part on a camera and a flip-up pin part having a recess for receiving a pin which is integrally formed with said planar plate part and which receives a driving force to swing said mirror member, said planar plate part consisting essentially of a part having undergone vacuum deposition treatment for convertng part into a reflection plane to reflect object luminous flux.

4,556,286

MULTILAYER GUEST HOST LIQUID CRYSTAL DISPLAY WITHOUT POLARIZERS

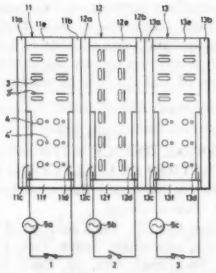
Tatsu Uchida, Sendai; Toru Teshima, Yokohama, both of Japan; Masanobu Wada, deceased, late of Sendai, Japan (by Eiko Wada, heiress); Masami Wada, heir, Hirakata, Japan, and Yuri Makuta, heiress, Kobe, Japan, assignors to Stanley Electric Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 158,275, Jun. 10, 1980. This application Jan. 3, 1983, Ser. No. 455,113

Claims priority, application Japan, Jun. 15, 1979, 54-74646

Int. Cl.⁴ G02F *1/133*

U.S. Cl. 350—335 **10 Claims**



1. A guest-host type liquid crystal display device not requiring the use of external polarizers, comprising:

a plurality of guest-host type liquid crystal cells which are superimposed one upon the other, two of which are constructed in a manner that the liquid crystal molecules contained in these two cells and located close to a boundary between the two cells are oriented in a direction parallel to the plane of the boundary, but that the direction of

orientation of the molecules in one of these two cells is perpendicular to that in the other cell when a voltage is applied to both cells, or alternatively when no voltage is applied to both cells, or alternatively when a voltage is applied to only one of these two cells to exhibit a dark state and a clear state.

4,556,287

FLUORESCENT LIQUID CRYSTAL DISPLAY DEVICES

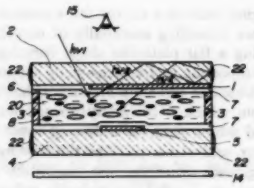
Fumiaki Funada, Yamatokoriyama; Masataka Matsura, Tenri, and Tomio Wada, Ikoma, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 935,246, Aug. 21, 1978, abandoned. This application Aug. 19, 1983, Ser. No. 524,475

Claims priority, application Japan, Aug. 29, 1977, 52-41019; Aug. 29, 1977, 52-104040; Nov. 7, 1977, 52-133848; Feb. 3, 1978, 53-11583; Feb. 3, 1978, 53-11589; Feb. 3, 1978, 53-11590; May 15, 1978, 53-57829

Int. Cl.⁴ G02F *1/133, 1/137*

U.S. Cl. 350—336 **26 Claims**



1. A fluorescent liquid crystal display device comprising an external excitation means, at least one pair of electrodes, parallel plates with adjoining sidewalls having a fluorescent liquid crystal composition therein containing a two-color absorbing fluorescent material capable of emitting visible fluorescence, depending upon the specific orientation of said fluorescent material, in response to incident radiation, said parallel plates comprising a transparent support plate and a rear base plate each having an inner surface and an outer surface, said at least one pair of electrodes comprising a display electrode of transparent material provided on said inner surface of said support plate and a rear electrode having a patterned configuration provided on said inner surface of said base plate such that said display and rear electrodes are in a facing relationship to each other, said base plate and rear electrode being made of a reflective material, and a liquid crystal molecular orientation layer formed at an interface between said respective electrodes and said liquid crystal composition, said display device further including a background plate positioned behind said rear base plate having an absorption spectra substantially the same as the emission spectra of said fluorescent material.

4,556,288

LIQUID CRYSTAL DEVICE WITH ANTI-REFLECTION FUNCTION IN DIELECTRIC LAYER

Nobuyuki Sekimura, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 22, 1982, Ser. No. 435,961

Claims priority, application Japan, Oct. 27, 1981, 56-172556; Oct. 28, 1981, 56-173541; Oct. 28, 1981, 56-173542; Oct. 28, 1981, 56-173543; Oct. 29, 1981, 56-173557

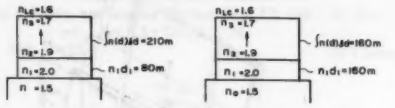
Int. Cl.⁴ G02F *1/13, 1/135*

U.S. Cl. 350—339 R **6 Claims**

1. A liquid crystal device with an anti-reflection function comprising:

a liquid crystal; and

two electrode-substrates so positioned as to sandwich said liquid crystal therebetween, at least one of said substrates including a transparent substrate, a transparent electrode provided thereon, and a dielectric layer provided on said electrode and facing said liquid crystal, said dielectric layer comprising a single layer and having a refractive index which decreases in the direction of thickness thereof



from the side of said transparent electrode toward the side of said liquid crystal to reduce the light in the visible wavelength range to be reflected by said electrode.

4,556,289

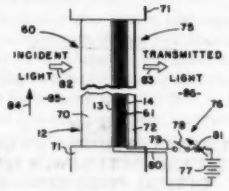
LOW BIREFRINGENCE ENCAPSULATED LIQUID CRYSTAL AND OPTICAL SHUTTER USING SAME

James L. Fergason, Kent, Ohio, assignor to Manchester R & D Partnership, Pepper Pike, Ohio

Filed Mar. 21, 1983, Ser. No. 477,078

Int. Cl.⁴ G02F *1/13*

U.S. Cl. 350—350 R **56 Claims**



1. A method of making a light control device of low birefringence liquid crystal material comprising mixing low birefringence liquid crystal material and an encapsulating medium to form an emulsion of capsule-like containment media containing discrete quantities of liquid crystal material, and adding pleochroic dye to the mixture of low birefringence liquid crystal material.

4. A method of controlling light transmitted through a medium having an optically transparent characteristic comprising applying to such medium an encapsulated low birefringence operationally nematic liquid crystal material containing pleochroic dye, and controlling the direction of the pleochroic dye without substantially scattering light having an image characteristic impinging on such liquid crystal and pleochroic dye thereby to control the intensity of transmitted light while substantially preserving the image of such transmitted light.

9. An optical apparatus through which an image may be clearly viewed in all operational modes of said apparatus, comprising a low birefringence encapsulated liquid crystal material of operationally nematic liquid crystal in a containment medium, and pleochroic dye in said liquid crystal material.

4,556,290

LIGHT SOURCE WITH ACOUSTO-OPTIC DEFLECTOR AND AFOCAL LENS SYSTEM

Maurice Roulot, 144 Boulevard de la Terrasse, 91400 Orsay, France

Filed Jun. 4, 1982, Ser. No. 385,196

Claims priority, application France, Jun. 4, 1981, 81 11049

Int. Cl.⁴ G02F *1/11*

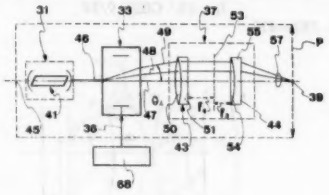
U.S. Cl. 350—358 **2 Claims**

1. A light source comprising:

an emitter of light, which, when in operation, emits a beam of light composed of a plurality of different wavelengths

$\lambda_1, \lambda_2, \ldots$

a controllable acousto-optic light deflector having a control input, a light inlet surface disposed to receive the light beam from said emitter and a light outlet surface from which said light beam propagates as a plurality of beams after deflection through respective angles θ_i which are a function both of a control signal applied to said control input and of the wavelength of each deflected beam,



an optical system having an inlet surface disposed to receive said deflected beams from the defelctor, said optical system serving to focus said beams substantially to a single point, with said beams leaving the optical system at angles θ_2, said optical system being made from highly dispersive substances and comprising two lens components mounted as an afocal system having focal lengths f_1 and f_2 respectively varying with the light wavelength in accordance with the relationships:

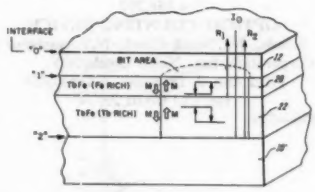
$$df_1 = -df_2 = \frac{f_1 \cdot f_2}{f_1 + f_2} \cdot \frac{d\lambda}{\lambda}$$

4,556,291

MAGNETO-OPTIC STORAGE MEDIA

Tu Chen, Saratoga, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Aug. 8, 1983, Ser. No. 520,922
Int. Cl.⁴ G02F *1/09*; G11C *13/06*
U.S. Cl. 350—377 **6 Claims**



1. A magneto-optic storage media including first and second layers of magnetic material, said layers having oppositely sensed magneto-optic hysteresis loops.

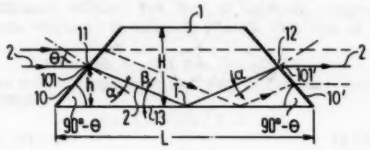
4,556,292

OPTICAL POLARIZER HAVING A PRISM

Konrad Mathyssek, Zorneding, and Hans Mahlein, Unterhaching, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Feb. 7, 1983, Ser. No. 464,586
Claims priority, application Fed. Rep. of Germany, Feb. 19, 1982, 3206040
Int. Cl.⁴ G02B *27/28*
U.S. Cl. 350—394 **8 Claims**

1. An optical polarizer for an optical isolator for optical message transmission without feedback, said optical polarizer having at least one prism having an entrance face and an exit face with a total reflection face extending therebetween, said entrance face and said exit face being respectively inclined relative to said total reflection face at an angle which is 90 degrees minus the Brewster angle, and said prism having an



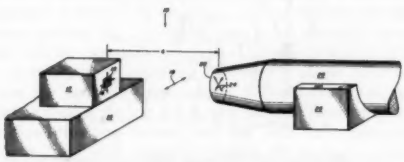
optical geometry such that a beam incident on said entrance face at an angle corresponding to the Brewster angle proceeds through said prism and is reflected by said total reflection face to be incident on said exit face at an angle which is substantially identical to the angle of refraction at said entrance face.

4,556,293

BROADBAND UNPOLARIZED LIGHT SOURCE

William K. Burns, Alexandria, Va., and Robert P. Moeller, Ft. Washington, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 2, 1983, Ser. No. 490,892
Int. Cl.⁴ G02F *1/01*
U.S. Cl. 350—400 **6 Claims**



1. An unpolarized light source comprising:
means for generating a broadband beam of light having a predominant plane of polarization; and
means for depolarizing said light beam comprising a highly birefringent optical fiber having birefringence axes with different group velocities corresponding to each axis, and one of its ends coupled to said light generating means with each of said birefringance axes orientated approximately 45 degrees away from said predominant plane of polarization of said light generating means, and having a physical length long enough to produce an optical differential path length between said birefringance axes which is longer than the coherence length of said broadband beam of light in said fiber.

4,556,294

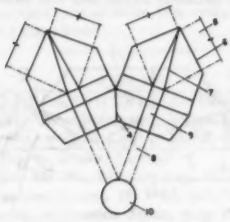
HEXAGONAL CONICAL BEAM CONCENTRATOR

John E. Clegg, 2320 Keystone Dr., Orlando, Fla. 32806

Filed Oct. 15, 1984, Ser. No. 660,688
Int. Cl.⁴ F24J *3/02*; G02B *3/04*
U.S. Cl. 350—432 **1 Claim**

1. A hexagonal conical beam concentrator RT:C comprising;
a. A conical stage lens RT (1) with a convex conical section (6) and a concave conical section (7),
b. A hexagonal base (3) comprising a solid with three pairs of opposed equidimensional sides (4) disposed at equal angles toward the central axis of hexagon formed by the solid,

with the projected planes of the sides (4) converging so as to intersect the axis at a common point, and



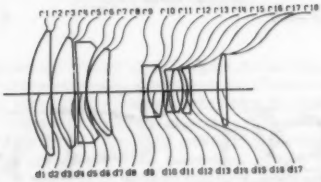
c. An intermediate adjoining section (2) comprising a solid mounted between conical stage lens RT (1) and hexagonal base (3).

4,556,295

ULTRACOMPACT TELEPHOTO LENS

Sadao Okudaira, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 27, 1983, Ser. No. 498,907
Claims priority, application Japan, May 31, 1982, 57-92771
Int. Cl.⁴ G02B *13/02*
U.S. Cl. 350—454 **2 Claims**



1. An ultracompact telephoto eight-component ten-element lens comprising, in order from an object, a front four-component four-element lens group including a first positive lens having a surface of a smaller radius of curvature directed toward the object, a second positive lens having a surface of a smaller radius of curvature directed toward the object, a third double-concave lens, and a fourth positive-meniscus lens having a surface of a smaller radius of curvature directed toward the object, an intermediate three-component five-element lens group including a compound lens composed of a fifth negative lens and a sixth double-convex lens, a compound lens composed of a seventh negative lens and an eighth double-convex lens, and a ninth negative lens having a surface of a smaller radius of curvature directed toward the object, and a rear lens component including a tenth positive lens, the telephoto lens being arranged to meet the following conditions:

$$\frac{\nu_1 + \nu_2 + \nu_4}{3} > 75 \quad (1)$$

$$0.4 > F_{1,2,3,4}/F > 0.2 \quad (2)$$

$$\frac{(n_5 + n_7) - (n_6 + n_8)}{2} > 0.1 \quad (3)$$

$$0.07\,F > d_{16} > 0.03\,F \quad (4)$$

where

ν_i is the Abbe number of the ith lens,

$F_{1, 2, 3, 4}$ is the combined focal length of the first to fourth lenses,

F is the combined focal length of the overall lens system,

n_i is the refractive index at d-line of the ith lens, and

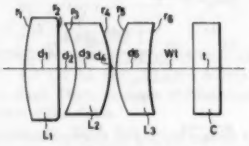
d_{16} is the distance between the ninth and tenth lenses.

4,556,296

OBJECTIVE LENS FOR USE WITH INFORMATION STORAGE DISKS

Takahiro Sugiyama, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 30, 1982, Ser. No. 430,146
Claims priority, application Japan, Oct. 6, 1981, 56-159042
Int. Cl.⁴ G02B *9/14*
U.S. Cl. 350—475 **4 Claims**



1. An objective lens for use with an information storage disk comprising a three-component, three-element lens system including a first component composed of a positive-meniscus lens having a convex side directed toward a light source, a second component composed of a negative-meniscus lens having a concave side directed toward the light source, and a third component composed of a positive-meniscus lens having a convex side directed toward the light source, said objective lens satisfying the following requirements:

(1) $1.8F < F_1 < 2.5F$

(2) $|F_2| > 25F$

(3) $1.2F < F_3 < 1.8F$

(4) $d_4 < 0.3F$

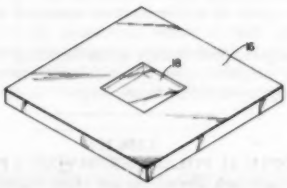
where F is the overall focal length of the lens system, F_1 is the focal length of the first component, F_2 is the focal length of the second component, F_3 is the focal length of the third component, and d_4 is the air spacing between the second and third components.

4,556,297

OPTICAL COUNTING DEVICE

Frank C. Schulz, Jr., North Creek, N.Y., assignor to Barton Mines Corporation, Inc., North Creek, N.Y.

Filed Aug. 2, 1983, Ser. No. 519,636
Int. Cl.⁴ G02B *21/24*
U.S. Cl. 350—529 **6 Claims**



1. An optical counting device of the type used in counting garnet and like particles comprising:

A. A transparent plate imprinted with a gridiron in its mid-portion;

B. An absorbent pad, having an open space cut in its center, removably supported upon said plate and conformed such that the gridiron of the glass plate is in register with the open space of the absorbent pad; and

C. A housing having an open space in register with said

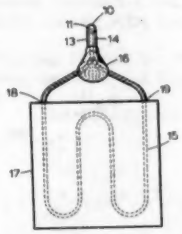
gridiron and said absorbent pad open space, said housing peripherally engaging the abutting edges of said plate and said pad.

4,556,298

NON-FOGGING BATHROOM MIRROR

Robert G. Gottlieb, 15803 Mill Point, Houston, Tex. 77059

Filed Jul. 13, 1984, Ser. No. 630,823
Int. Cl.[4] G02B *5/08, 7/18*
U.S. Cl. 350—588 13 Claims



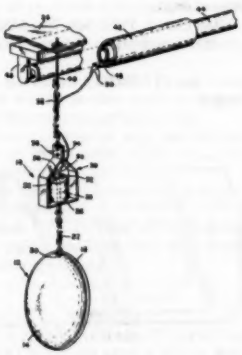
1. A non-fogging mirror structure comprised of:
a section of pipe through which heated water flows, said section of pipe having an outlet and an inlet on its surface, means located within said pipe section for inducing the flow of water into said outlet,
a conduit with one end of said conduit connected to said outlet and the other end of said conduit connected to said inlet,
a reflecting surface with its back joined in heat-conducting relationship to said conduit.

4,556,299

LIGHT POWERED ROTATING DETECTION MIRROR

Frederick Silver, Miami, Fla., assignor to Fred Silver & Company, Inc., Newark, N.J.

Filed Mar. 12, 1984, Ser. No. 588,492
Int. Cl.[4] G02B *5/10, 7/18*
U.S. Cl. 350—603 6 Claims



1. A light energy powered rotating detection mirror comprising:
a. a detection mirror including two back-to-back convex mirrors;
b. support means for supporting said detecting mirror above a surface;
c. motor means for rotating said detection mirror; and
d. power means responsive to a source of light energy for supplying power to said motor means so as to operate said motor and cause said detection mirror to rotate whenever light energy is supplied to the power means.

4,556,300

PAD ASSEMBLY FOR EYEGLASS FRAMES

Anton Dietrich, Munich, Fed. Rep. of Germany, assignor to Optische Werke G. Rodenstock, Munich, Fed. Rep. of Germany

Filed Feb. 4, 1983, Ser. No. 463,726
Claims priority, application Fed. Rep. of Germany, Feb. 18, 1982, 3205900
Int. Cl.[4] G02C *5/12*
U.S. Cl. 351—137 12 Claims

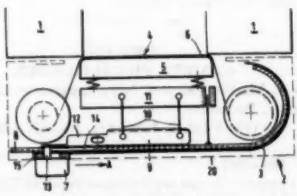
1. A pad assembly for eyeglass frames, comprising a nose pad means with a molded-in insert means having a mounting portion provided with a mounting opening, a pad arm which at its one end is connected with an eyeglass frame and at its other end includes a connecting area, to which is coordinated the mounting portion, the connecting area being operable to be inserted into the mounting opening and being provided with at least one enlargement extending transversely to the insertion direction, the mounting opening being so dimensioned that the connecting area of the pad arm is adapted to be inserted in the longitudinal direction thereof, and that with the connecting area inserted into said mounting opening, the mounting opening is reduced by plastic deformation of the mounting portion in a direction substantially transverse to the insertion direction to such an extent that the mounting opening permanently reduced by said plastic deformation produces a form-locking connection of the mounting portion with the pad arm.

4,556,301

ATTACHMENT CASSETTE FOR A ROLL FILM CASSETTE-TYPE PHOTOGRAPHIC CAMERA

Hansjürgen Hartung, Wolfenbüttel, Fed. Rep. of Germany, assignor to Rollei Fototechnic GmbH, Brunswick, Fed. Rep. of Germany

Filed Feb. 2, 1984, Ser. No. 576,525
Claims priority, application Fed. Rep. of Germany, Feb. 3, 1983, 3303603
Int. Cl.[4] G03B *23/02*
U.S. Cl. 352—78 R 11 Claims



1. An attachment cassette for use in a roll film cassette type camera having a camera housing provided with a film gate,

comprising a cassette housing attachable to the camera housing and having a front wall formed with an opening in alignment with said film gate, a rear wall, control means attached for sliding movement along said rear wall, a flexible elongated closing member secured to said control means and being arranged for sliding movement in said cassette housing between a starting position in which it is out of the range of said opening, and an end position in which it closes said opening, a film pressure plate arranged in said cassette housing opposite said opening, and a pressure plate actuating means coupled to said control means for adjusting the position of said pressure plate relative to said opening in response to the position of said control means.

4,556,302

CAMERA BOX FOR MICROFILM CAMERAS

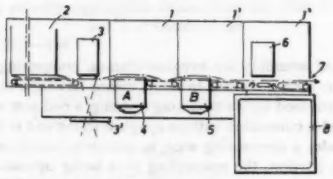
Josef Schaut, Karben; Peter Ruppel, Bad Nauheim, and Karl Hültner, Friedberg, all of Fed. Rep. of Germany, assignors to Firma SMA Schaut GmbH, Karben, Fed. Rep. of Germany

Filed Aug. 22, 1983, Ser. No. 524,900

Claims priority, application Fed. Rep. of Germany, Aug. 25, 1982, 3231539; Dec. 8, 1982, 3245333

Int. Cl.⁴ G03B *17/50*

U.S. Cl. 354—83 **8 Claims**



1. A camera box for a microfilm camera for processing a film carried by an aperture card, which comprises

(a) an elongated housing,

(b) a magazine for a series of the aperture cards in the housing,

(c) a film exposure station arranged in the housing to receive the aperture cards from the magazine in sequence,

(d) conveying means arranged in the housing for conveying a respective one of the aperture cards carrying an exposed film, the conveying means defining a travel path for the aperture cards in the housing,

(e) a drying station in the travel path, and

(f) the improvement comprising

(1) a first station for completely developing the exposed film of the respective aperture card and

(2) a second, like station for completely developing the exposed film of a subsequent one of the aperture cards, the first and second developing stations being arranged in the travel path between the exposure and drying stations, and the conveying means being arranged for alternatively delivering the sequence of aperture cards carrying the exposed films from the exposure station to the first and second developing stations.

4,556,303

CAMERA FLASH HOLDER

William A. Martin, Fairport, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

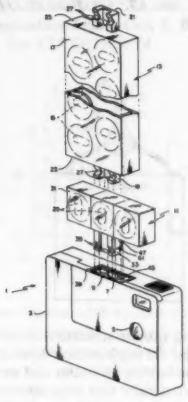
Filed Jul. 2, 1984, Ser. No. 627,178

Int. Cl.⁴ G03B *15/03*

U.S. Cl. 354—141 **7 Claims**

1. In a camera for use with various types of flash units which (a) are to be located in respective positions to space the individual flash types at least a minimum distance from a photographing objective to substantially avoid red eye and (b) have distinguishable means indicative of their respective positions, the combination comprising:

holder means for receiving the various types of flash units, said holder means having a plurality of positions corresponding to the respective positions of the various flash types for locating a flash unit received by said holder means at least the minimum distance from the photographing objective;



means supporting said holder means for movement to its respective positions; and

means for distinguishing between the indicative means of the various flash types to determine the position of said holder means for locating a flash unit received by said holder means at least the minimum distance from the photographing objective.

4,556,304

AUTOFOCUS CAMERA INCLUDING A COVER FOR A TAKING LENS AND DIAGONALLY DISPOSED RANGE FINDER WINDOWS

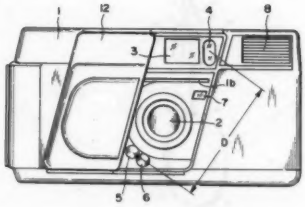
Hiroshi Fukuda, Tokyo, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 2, 1984, Ser. No. 656,910

Claims priority, application Japan, Oct. 3, 1983, 58-152038[U]

Int. Cl.⁴ G03B *3/00, 17/02*

U.S. Cl. 354—288 **7 Claims**



1. An autofocus camera having a camera body and on the front face of the camera body having a taking lens and at least two rangefinder windows for measuring the distance to the object to be photographed, the rangefinder windows being disposed on opposite sides of the taking lens in diagonally upper and lower positions, and a protective cover disposed slidably on said camera body for sliding movement between open and closed positions, the cover having an edge that is

slanted toward the direction of a line passing through said oppositely disposed rangefinder windows, said protective cover sheltering said rangefinder windows and said taking lens when closed and retreating from and exposing said taking lens and said rangefinder windows when open, said edge passing over said lens and windows during opening and closing movement of said cover.

4,556,305

ARRANGEMENT FOR AND METHOD OF REGENERATING PROCESSING BATHS FOR PHOTOSENSITIVE MATERIALS

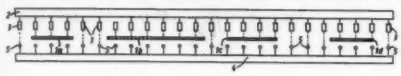
Viktor Osegowitsch, Taufkirchen, Fed. Rep. of Germany, assignor to AGFA-Gevaert A.G., Leverkusen, Fed. Rep. of Germany

Filed Sep. 27, 1982, Ser. No. 424,274

Claims priority, application Fed. Rep. of Germany, Oct. 29, 1981, 3142881

Int. Cl.⁴ G03D *13/00*

U.S. Cl. 354—298 **32 Claims**



1. An arrangement for continuously developing sheet-like photosensitive articles having different widths, said arrangement comprising:

(a) a container for accommodating a processing bath;

(b) conveying means for conveying said articles through said container in a predetermined direction transverse to said widths;

(c) sensing means for sensing the sizes of articles conveyed through said container, said sensing means including a measuring device for determining the speed of advance of said articles through said container, and said sensing means further including a series of substantially uniformly spaced sensing devices disposed in a row which extends transversely of said predetermined direction, said sensing devices being arranged such that the spacing between adjacent ones of said sensing devices is smaller than the magnitude of the smallest difference between said widths and such that the number of sensing devices which sense the presence of an article is representative of a single one of said widths;

(d) activating means for activating said sensing devices sequentially;

(e) storage means connected with said sensing means and relating said widths to the number of sensing devices which sense the presence of an article;

(f) summing means connected with said storage means and operative to total the widths of articles conveyed through said container;

(g) regenerating means for introducing a regenerating agent into said container; and

(h) control means for regulating said regenerating means in response to signals received from said measuring device and said summing means.

4,556,306

FILM PROCESSING APPARATUS INCLUDING A VACUUM PICKUP HEAD FOR A FILM PROCESSING FLUID CONTAINER

Duncan C. Sorli, Chelmsford, Mass., and John H. Keightley, Richmond, Canada, assignors to Polaroid Corporation, Cambridge, Mass.

Filed Oct. 25, 1984, Ser. No. 664,799

Int. Cl.⁴ G03D *9/02*

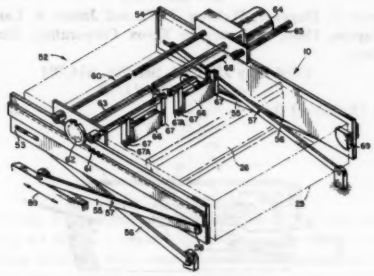
U.S. Cl. 354—304 **5 Claims**

1. Apparatus for automatically retrieving a film processing fluid container from a supply tray and thereafter depositing the retrieved container on one of a pair of converging positive and negative film sheets prior to processing, said retrieving and loading apparatus comprising:

a carriage;

at least one vacuum pickup head extending laterally downward from said carriage; and

means for moving said carriage in a generally horizontal direction longitudinally through said supply tray so that said pickup head may engage a respective one of the film processing fluid containers in the supply tray, said moving means then operating to raise said carriage and its accompanying fluid container so engaged from the supply tray in



a vertical direction transversely of said supply tray, and to thereafter move said carriage in a generally horizontal direction longitudinally above said supply tray so that the retrieved film processing fluid container may be moved aside of the supply tray to a location above one of the film sheets, said moving means thereafter operating to lower the fluid container into the vicinity of the one film sheet of the pair of film sheets upon which the fluid container is to be deposited so that release of the retrieved film processing fluid container by said vacuum pickup head results in the deposition of the fluid container on one of the converging positive and negative film sheets prior to processing.

4,556,307

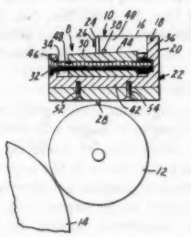
ADJUSTING APPARATUS FOR A DOCTOR BLADE STRUCTURE FOR COPY MACHINES

Steven C. Jensen, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Dec. 10, 1984, Ser. No. 679,932

Int. Cl.⁴ G03G *21/00*

U.S. Cl. 355—3 R **10 Claims**



1. Apparatus for adjusting the position of a movable doctor blade structure including:

a "U"-shaped support means with the connecting leg of the "U" presenting a flat surface;

a block member having a surface that is inclined relative to

said flat surface, said block member positioned in sliding contact with the doctor blade structure and for movement along said flat surface, said block having a threaded hole extending through said block; and

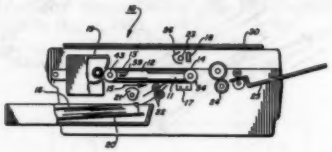
a screw member captively positioned between the legs of said "U"-shaped support means and extending through said threaded hole whereby rotation of said screw member alters the position of said block member which in turn alters the position of said doctor blade structure.

4,556,308

REMOVABLE PROCESSING CARTRIDGE FOR ELECTROSTATOGRAPHIC REPRODUCING APPARATUS

Werner F. Hoppner, Webster, N.Y., and James A. Landefeld, Dayton, Ohio, assignors to Xerox Corporation, Stamford, Conn.

Filed May 25, 1984, Ser. No. 614,201
Int. Cl.⁴ G03G *15/00*
U.S. Cl. 355—3 R **20 Claims**



1. A removable processing cartridge for an electrostatographic reproducing apparatus comprising a frame assembly containing at least one electrostatographic processing unit and means to mount said removable processing cartridge in a receiving mount in said reproducing apparatus, said mounting means on said cartridge comprising a pair of mounting hinge slots, one on each side of one end of said cartridge which are positioned for cooperative engagement with a pair of locating pivot pins located one on each side of the frame of the reproducing apparatus about which said cartridge may be pivoted and, a pair of mounting pins one on each side of one end of said cartridge adjacent said mounting hinge slots which pins are positioned for cooperative engagement with a pair of cartridge latch blocks located one on each side of the frame of the reproducing apparatus.

4,556,309

ELECTROPHOTOGRAPHIC IMAGING APPARATUS, PARTICULARLY FOR COLOR PROOFING AND METHOD

Harold J. Weber, Sherborn, Mass.; Manfred R. Kuehnle, New London, N.H.; Kenneth D. Fraser, Scarborough, Canada, and Kenneth A. Lindblom, Shrewsbury, Mass., assignors to Coulter Systems Corporation, Bedford, Mass.

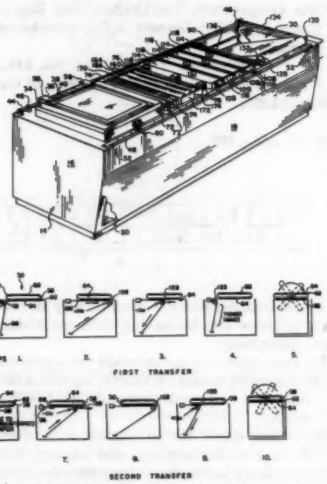
Filed Dec. 29, 1982, Ser. No. 454,480
The portion of the term of this patent subsequent to Nov. 27, 2001, has been disclaimed.
Int. Cl.⁴ G03G *15/14*
U.S. Cl. 355—3 TR **39 Claims**

1. An electrophotographic imaging apparatus for producing a print copy of a graphics image selectively either by direct transfer mode or offset transfer mode on a transfer medium from a transparency positioned in the apparatus in close proximity to an electrophotographic member having a photoconductive layer arranged to be sequentially translated along a linear path from functional station to functional station whereat to be charged at a charging station and exposed to radiant energy transmitted through said transparency at an exposure station to produce a latent image on said layer which can be toned at a toning station and the toner image thereafter transferred at a transfer station to said transfer medium to provide said print copy, the transparency having an emulsion side; said apparatus comprising:

A. platen means carrying the electrophotographic member mounted on one surface thereof, including support surface means capable of mounting a transfer medium at the transfer station on a second surface thereof, said platen means being movable in the linear path as the electrophotographic member is translated;

B. means for electrostatically charging the photoconductive layer;

C. means for exposing the charged layer to radiant energy while the transparency and electrophotographic member are proximate whereby to produce the latent image, said exposure means including means for transmitting the radiant energy from a source thereof;



D. means for applying a toner material to the latent image after such exposure to radiant energy; and

D. the transfer station being located to receive said platen means after the toner image is produced on the electrophotographic member carried thereon for selectively transferring the toner image to a transfer medium, the transfer station including:

(1) transfer means operable alternatively in a direct transfer mode and in an offset transfer mode which also includes an intermediate transfer medium constructed and arranged to be selectively positioned first for initially receiving the toner image and for offset transfer mode operation, thereafter the toner image being transferable from said intermediate transfer medium to the transfer medium.

4,556,310

COPYING OR PRINTING APPARATUS

Shunichi Masuda, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 267,706, May 28, 1981, abandoned.
This application Nov. 28, 1983, Ser. No. 556,149
Claims priority, application Japan, Jun. 3, 1980, 55-74520; Jun. 4, 1980, 55-75263; Jul. 21, 1980, 55-99550; Jul. 21, 1980, 55-99551; Oct. 9, 1980, 55-141192
Int. Cl.⁴ G03G *15/00*
U.S. Cl. 355—14 R **17 Claims**

1. A reproduction system, comprising:

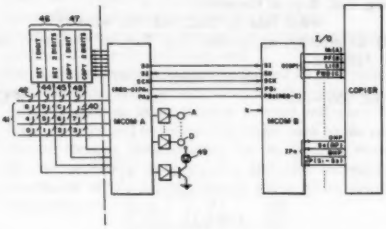
plural operable means for image reproduction, which includes key means for instruction and display means;

first one chip computer means provided with a data memory, a processor and a memory storing a program for operation control of some of said operable means;

second one chip computer means provided with a data memory, a processor and a memory storing a program for operation control of some other of said operable means;

a data line coupled between said first and second computer means; and

means adapted for transferring, one of said computer means to the other, the data necessary for operation control by



said other computer means, wherein said transferred data is in a form of serial pulses, and wherein said serial pulses are transferred through said data line coupled between said first and second computer means.

4,556,311

ELECTROPHOTOGRAPHIC COPYING APPARATUS

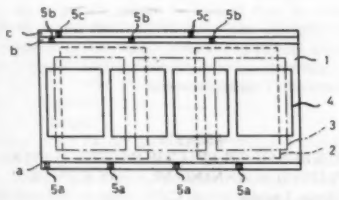
Izumi Tagoku, Machida, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Aug. 4, 1983, Ser. No. 520,188

Claims priority, application Japan, Aug. 5, 1982, 57-118288[U]

Int. Cl.⁴ G03G *15/00*

U.S. Cl. 355—14 R **8 Claims**



1. An electrophotographic copying apparatus comprising:

a photosensitive member having an image forming surface on which a plurality of images of respective different sizes can be formed in the course of an image forming process and;

control signal generating means disposed on the image forming surface of the photosensitive member for generating signals for controlling the image forming process for each respective one of said plurality of images of respective differen: sizes, said respective control signal generating means being located at respective positions corresponding to the respective forward edges of the images of respective different sizes to be formed on the photosensitive member, and said respective control signal generating means for images of different image sizes being disposed at respective different positions determined by the respective different sizes of images, and on respective different tracks which are outside the region of said image forming surface on which images are formed in the course of said image forming process; and said signal generating means for each of said tracks being detectable by respective sensors.

4,556,312

OPTICAL PRINTING DEVICES FOR PRINTING ON BLANKS WHICH ARE INTENDED FOR SWAGING

Gerard Vany, Malicorne-sur-Sarthe, France, assignor to Cebal, Clichy, France

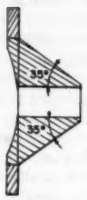
PCT No. PCT/FR83/00221, § 371 Date Jun. 13, 1984, § 102(e) Date Jun. 13, 1984, PCT Pub. No. WO84/02008, PCT Pub. Date May 24, 1984

PCT Filed Nov. 8, 1983, Ser. No. 624,666

Claims priority, application France, Nov. 10, 1982, 82 19353

Int. Cl.⁴ G03B *27/68*

U.S. Cl. 355—47 **4 Claims**



1. Device for the printing of blanks which are intended for swaging, to obtain a preformed image on the blanks which, following swaging, will reconstitute the original image, comprising a light source, a toric prism, and a camera having a common optical axis,

the angle of said toric prism being less than 42.05°, and

said toric prism having a surface facing said camera forming a linearity correction lens, the cutting of said lens-forming surface being defined, in a system of parametric coordinates x_t and y_t centered on the intersection point of the optical axis, and by a reference plane parallel to said surface of the prism, defined by the equations:

$$x_t = \left(C_1 + \frac{t}{C_2}\right) C_3$$

$$y_t = y_{t-1} + (x_t - x_{t-1}) \frac{p \cos \alpha - 1/C_2}{C_4}$$

the C_1, C_2, C_3, and C_4 parameters being defined from the inside diameter Φ_o and the height H of toric prism, from the offset A of the plate to be reproduced in relation to the edge of the prism, from the focal length F of the lens of camera and from the refraction index n of the material forming the prism and from the top angle $(45 - \alpha)$ of said prism.

4,556,313

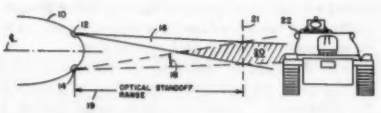
SHORT RANGE OPTICAL RANGEFINDER

Walter E. Miller, Jr.; Richard G. Westrich, Jr., both of Huntsville, and Michael M. Jones, Arab, all of Ala., assignors to United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 18, 1982, Ser. No. 434,796

Int. Cl.⁴ G01C *3/10, 3/08;* F42C *13/02*

U.S. Cl. 356—1 **2 Claims**



1. A short range optical rangefinder comprising: transmitting means for transmitting directional optical energy; receiv-

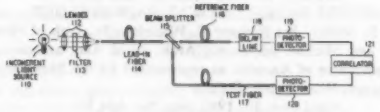
ing means closely adjacent to said transmitting means and disposed to provide a directional field of view for receiving directional reflected radiation of said optical energy and for providing an output signal in response thereto; said transmitting means being disposed for directing said radiation into the field of view of said receiving means for establishing a signal window region in close proximity to said transmitting and receiving means where the field of view and the transmitted radiation are coincident, said window having a plane therethrough at a predetermined spatial distance from said transmitting means and said receiving means for establishing a desired standoff distance from said transmitting means and said receiving means, said output signal being an output pulse indicative of passage of an object into said window and through said plane; and wherein said receiving means comprises a sensor for receiving optical energy and providing a variable electrical signal output responsive to variations in optical signal amplitude, a synchronous detector responsive to said variable electrical signal output for providing a direct current level output indicative of said variations in signal amplitude of said detected optical energy, and first and second signal detection circuits having inputs coupled in parallel to the output of said synchronous detector; said first signal detection circuit being a comparator for providing an output signal after a predetermined input signal level is received, and said second signal detection circuit providing an output signal when a peak in input signal level occurs; and wherein said transmitting means comprises a clock for providing a high frequency square wave output, light emitting means, and a driving means responsive to the output of said clock for stimulating said light emitting means to emission, said square wave output from said clock being further coupled to said receiving means synchronous detector for generating said detector's direct current output level which follows the amplitude of said reflected radiation.

4,556,314

DISPERSION DETERMINING METHOD AND APPARATUS

Julian Stone, Rumson, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Aug. 31, 1983, Ser. No. 528,068
Int. Cl.⁴ G01N *21/27*
U.S. Cl. 356—73.1 **14 Claims**



1. Apparatus for use in determining the dispersion of an optical fiber comprising

first and second signal paths, at least a portion of each of said paths being capable of carrying optical signals, at least one of said paths including said optical fiber,

means for directing an optical signal from a source into each of said paths, each of said paths including a photodetector for generating a detector output signal having a signal envelope,

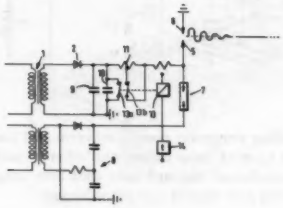
means for varying the relative delay along said paths, and means for cross-correlating said envelopes.

4,556,315

PROCESS AND APPARATUS FOR THE EMISSION-SPECTROSCOPICAL TESTING OF METALLIC SAMPLES

Wilhelm Berstermann, Georgsmarienhütte, Fed. Rep. of Germany, assignor to Klöckner-Werke Aktiengesellschaft, Duisburg, Fed. Rep. of Germany

Filed Dec. 1, 1982, Ser. No. 446,051
Claims priority, application Fed. Rep. of Germany, Dec. 2, 1981, 3147642
Int. Cl.⁴ G01N *21/67*
U.S. Cl. 356—313 **3 Claims**



1. A power transformer for the emission-spectroscopical testing of a metallic sample by unipolar discharges of a spark spectrum during a spark period, comprising:

a primary circuit means and a secondary circuit means;

said secondary circuit means including a control spark gap and means for producing said spark spectrum by said unipolar discharges between the metallic sample and a counterelectrode;

said primary circuit controlling said secondary circuit;

said secondary circuit further including discharge capacitance means and discharge resistance means electrically connected to one another; and

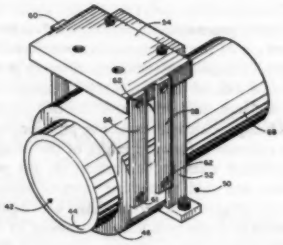
said primary circuit including means for changing at least one of the capacitance of said capacitance means and the resistance of said resistance means during a pre-spark period, whereby said secondary circuit means produces oscillating discharges during said pre-spark period to remove any material of the tested metallic sample precipitated onto said counterelectrode.

4,556,316

INTERFEROMETER SPECTROMETER HAVING SIMPLIFIED SCANNING MOTION CONTROL

Walter M. Doyle, Laguna Beach, Calif., assignor to Laser Precision Corporation, Utica, N.Y.

Filed Mar. 1, 1983, Ser. No. 470,936
Int. Cl.⁴ G01B *9/02*
U.S. Cl. 356—346 **8 Claims**



1. For use in a spectrometer having means for receiving and integrating successive analytical interferograms provided by an analytical beam, an interferometer, of the type having a

fixed-length arm and a variable-length arm which is varied to cause spectral scanning, comprising:

a supporting structure adapted to carry a moving reflector in the variable-length arm;

a plurality of arms pivotally connected to and suspended from the supporting structure;

a retroreflector pivotally carried by the arms;

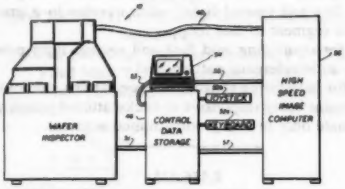
a linear electro-magnetic motor for causing reciprocating motion of the retroreflector; and

a flat stationary mirror located adjacent to and facing the retroreflector, and partially blocking the open end of the retroreflector so as to receive a beam reflected by the retroreflector and to reflect that beam back to the retroreflector, thereby compensating for the shearing motion of the retroreflector as it travels, and also increasing the resolution of the interferometer for a given amount of retroreflector travel.

4,556,317
X-Y STAGE FOR A PATTERNED WAFER AUTOMATIC INSPECTION SYSTEM

Paul Sandland, Gilroy; Curt H. Chadwick, Los Altos, and Howard I. Dwyer, Mountain View, all of Calif., assignors to KLA Instruments Corporation, Santa Clara, Calif.

Filed Feb. 22, 1984, Ser. No. 582,582
Int. Cl.⁴ G01B *11/00*
U.S. Cl. 356—237 **18 Claims**



18. In a patterned wafer automatic inspection system for providing separate macro and micro inspection stations, apparatus for positioning a wafer in each inspection station and moving the wafer from one inspection to the other other, which comprises:

an X-Y stage;

a base plate fixedly mounted on said X-Y stage;

a first stop located adjacent the left side of said base plate;

a second stop located adjacent the right side of said base plate;

a macro-micro transport arm being pivotally interconnected with said base plate, said arm riding on air bearings above said base plate so as to be free to move;

drive means for moving said transport arm;

link means for interconnecting said drive means and said transport arm whereby said arm is driven against either one of said first or second stop;

a turntable centrally interconnected with said arm and supported on air bearings so as to be free to rotate without moving said arm; and

a vacuum chuck centrally located on said turntable for holding said wafer.

4,556,318
SPECTROCHEMICAL ANALYSIS

Ramon M. Barnes, Hadley, Mass., and Peter Fodor, Budapest, Hungary, assignors to Allied Corporation, Morristown, N.J.

Filed Jun. 7, 1983, Ser. No. 501,840
Int. Cl.⁴ G01N *21/73*
U.S. Cl. 356—316 **17 Claims**

1. A spectroanalytical system for determining the quantity of a substance of interest in a sample material comprising

sample excitation apparatus for exciting sample material to an atomic state for analysis,

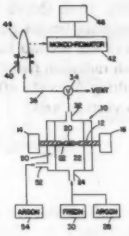
means for monitoring said sample excitation apparatus,

a source of transport gas,

a sample chamber for receiving a sample to be analyzed,

heating means for vaporizing a sample to be analyzed in said sample chamber and forming particles of said sample of sufficiently small size to form an aerosol,

said sample chamber being connected in a flow path between said source of transport gas and said sample excitation apparatus, and



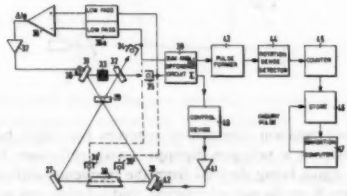
pressure relief means in said flow path for relieving pressure increases resulting from rapid heating of said sample by said heating means to minimize pressure transients in the aerosol stream transported from said chamber to said excitation apparatus,

said pressure relief means including structure defining a flow restriction passage between a location external to said flow path and said sample chamber, said flow restriction passage normally permitting gas flow from said location external to said flow path into said sample chamber but also permitting a reversal of gas flow direction through said flow restriction sufficient to prevent output signal level depression at said sample excitation apparatus.

4,556,319
SENSOR OF ROTATIONAL VELOCITY ON THE BASIS OF A RING LASER

Rolf Gauert; Rüdiger K. Rodloff, both of Brunswick, and Gerald H. Siol, Bad Münder, all of Fed. Rep. of Germany, assignors to Deutsche Forschungs- und Versuchsanstalt fur Luft- und Raumfahrt e.V., Cologne, Fed. Rep. of Germany

Filed Apr. 15, 1982, Ser. No. 368,574
Claims priority, application Fed. Rep. of Germany, Apr. 21, 1981, 3115869
Int. Cl.⁴ G01C *19/64*
U.S. Cl. 356—350 **3 Claims**



1. A sensor of rotational velocity on the basis of a ring laser, comprising

(a) a first radiation path having three corner mirrors and leading through an active medium,

(b) a second radiation path leading through a Faraday cell causing a phase difference between two radiation beams circulating in opposite directions, the second radiation

path having three corner mirrors one of which is common to the two radiation paths and has a transparency of 5% at maximum,

(c) the second radiation path being formed as a passive resonator,

(d) the Faraday cell being constructed with a ferromagnetic garnet compound magnetized to saturation,

(e) first adjusting means for stabilizing the optical length of the second radiation path by adjusting one of its corner mirrors, which is not the one that is common to both radiation paths, parallel to itself and perpendicularly to its plane, and

(f) means for detecting, from shares of the clockwise and anticlockwise circulating beams penetrating that one of the corner mirrors of the second radiation path which is not common to both radiation paths and is not adjustable, the phase shift resulting from the effective rotation of the ring laser about its vertical axis.

4,556,320

LASER ROTATION RATE SENSOR

Jakob Kranz; Joachim Kaiser, both of Düsseldorf; Hans-Bertram Wiegemann, Schriesheim, and Klaus U. Baron, Heidelberg, all of Fed. Rep. of Germany, assignors to TELDIX GmbH, Heidelberg, Fed. Rep. of Germany

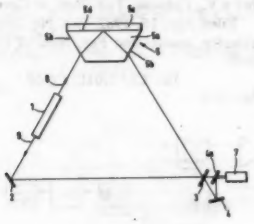
PCT No. PCT/EP82/00122, § 371 Date Feb. 9, 1983, § 102(e) Date Feb. 9, 1983, PCT Pub. No. WO82/04483, PCT Pub. Date Dec. 23, 1982

PCT Filed Jun. 10, 1982, Ser. No. 468,059

Claims priority, application Fed. Rep. of Germany, Jun. 13, 1981, 3123518

Int. Cl.⁴ G01C *19/64*

U.S. Cl. 356—350 **15 Claims**



1. A laser rotation rate sensor wherein two light beams counterrotate in a polygon equipped with reflectors in its corners, a signal being derived from the frequency difference which depends on the rate of rotation, said rotation rate sensor further including a reflector comprising a magneto-optic element for the suppression of lock-in, characterized in that said reflector includes a prism whose base boundary face is provided with a layer of a material having a lower index of refraction than the prism material; that at least one of said materials is a gyrotropic material; and that the angle of incidence of the beams on the interface with respect to the layer having the lower index of refraction is so large that total reflection occurs.

4,556,321

RING INTERFEROMETER WITH AN ARRANGEMENT TO ELIMINATE FALSE INDICATIONS

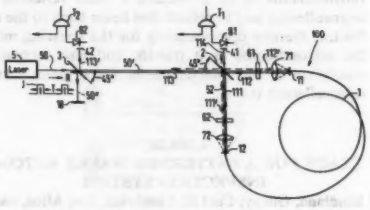
Gerhard Schiffner, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Aug. 19, 1980, Ser. No. 179,568

Claims priority, application Fed. Rep. of Germany, Sep. 7, 1979, 2936285

Int. Cl.⁴ G01B *9/02*

U.S. Cl. 356—350 **4 Claims**



4. An interferometer, comprising:

a loop of fiber optic material;

means for introducing a first light pulse and a second light pulse into said loop, said first and second light pulses having opposite directions of travel in said loop so that said first and second light pulses overlap in a predetermined segment of said loop;

means for combining said first and second light pulses to form an interference pattern; and

means for monitoring the interference pattern, said monitoring means being responsive to backscattered waves which originate only in said predetermined segment.

4,556,322

ARRANGEMENT FOR CHECKING DIMENSIONAL ACCURACY

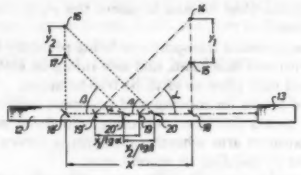
Kjell J. Wickman, Stockholm, and Klas R. Wiklund, Täby, both of Sweden, assignors to Pharos AB, Lidingo, Sweden

Continuation-in-part of Ser. No. 256,909, Apr. 23, 1981, abandoned. This application Feb. 16, 1984, Ser. No. 580,699

Claims priority, application Sweden, Apr. 23, 1980, 8003079

Int. Cl.⁴ G01B *11/14*; G01C *3/02*; G02F *1/29*

U.S. Cl. 356—375 **20 Claims**



1. An apparatus for checking dimensions in two dimensions in a horizontal plane of large objects having predetermined checking points, comprising:

a single straight measuring guide bar having a longitudinal axis;

a light source located at one end of the guide bar arranged to project a beam along a path parallel to the guide bar;

at least two light-deflecting units each of which receives and deflects a light beam from said light source, each light-deflecting unit having selection means for selecting one beam deflection angle out of a limited amount of predetermined, exactly defined, presettable beam deflection angles which are angled with respect to a vertical plane contain-

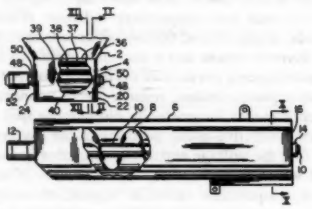
ing the longitudinal axis of the guide bar, the beam-deflecting unit comprising two reflecting surfaces located in the beam path in a manner similar to the reflecting surfaces of a pentagonal prism such that the deflected light beams have different intersecting points with said plane; at least one slidable unit containing at least one of said light-deflecting units being movable along the guide bar such that the light-deflecting units have their individual deflected light beams impinging on each checking point simultaneously, and by movement of said at least one slidable unit containing said at least one of said light-deflecting units having a preset beam deflection angle the intersecting point with the vertical plane of the beam moves in the plane; whereby by comparison of predetermined data for two dimensional distances between checking points of a model object of said object which is related to distances in said vertical plane for specific angular settings of said light-deflecting units and the corresponding angular position between each light beam and the vertical plane and the relative longitudinal positions of the intersecting points within the vertical plane, the dimensions in two dimensions of the object are checked.

4,556,323

CONCRETE MIXING AND DISTRIBUTION EQUIPMENT

Luther V. Elkin, 2431 Rte. 286 West, Indiana, Pa. 15701

Filed Mar. 7, 1984, Ser. No. 587,301
Int. Cl.[4] B28C *5/14*; B01F *11/00*
U.S. Cl. 366—31 **18 Claims**



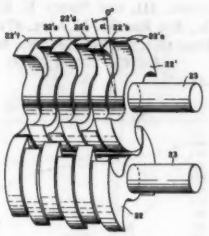
1. A metering wheel assembly comprising:
(a) a hollow, cylindrical drum rotatably mounted to a shaft;
(b) a plurality of circumferentially spaced and radially extending vanes mounted on the exterior surface of the drum; and
(c) a plurality of hammer assemblies located within the drum and disposed along the length of the metering wheel assembly, each of said hammer assemblies including:
(1) an inwardly directed impact plate mounted to the inner surface of the drum;
(2) an inwardly directed pusher plate mounted to the inner surface of the drum and angularly spaced from the impact plate; and
(3) a hammer rotatably mounted to the shaft and positioned between the impact plate and the pusher plate, whereby during each revolution of the drum the pusher plate moves the hammer about the shaft until it is directed vertically upward, the force of gravity rotates the hammer downward until it strikes the impact plate, the impact plate rotates away while the hammer hangs vertically downward, and the pusher plate again contacts the hammer and moves the hammer about the shaft.

4,556,324

APPARATUS FOR FORMING FILMS OF CONSTANT THICKNESS

Daniel G. Tynan, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed May 1, 1984, Ser. No. 605,806
Int. Cl.[4] B29B *1/10*
U.S. Cl. 366—85 **3 Claims**



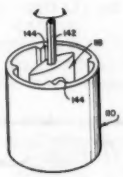
1. In an apparatus for processing fluid material that includes a housing having a plurality of cylindrical bores and a rotor in each of said bores intermeshed with each other, said rotors being counter-rotating at equal rotational speeds, the improvement of which comprises: each of said rotors having a peripheral surface configuration of radial curved portions followed by curves tangent to circles of constant diameter centered about points located on a prolate epicycloid, the radial portions of one rotor coacting with the prolate epicycloid related curved portion of the other rotor during rotation, to provide a constant clearance between the closest point of the rotors to each other and to form an open-ended chamber which diminishes in volume as rotation proceeds so that material in said chamber is expelled through said ends of said chamber as a film.

4,556,325

COMPARTMENTALIZED DYNAMIC MIXING APPARATUS

Leonard Katzin, 204 S. Swall Dr., Beverly Hills, Calif. 90211

Filed Oct. 6, 1983, Ser. No. 539,620
Int. Cl.[4] B01F *7/16*; B65D *23/04*
U.S. Cl. 366—130 **16 Claims**



1. Apparatus for storing and selectively mixing at least two distinct substances, comprising in combination:
A. container means for creating a substance holding chamber;
B. barrier means arranged within the chamber of the container means and normally attached thereto for separating the chamber into at least two compartments, each of the compartments holding a quantity of a substance different from a substance being held in each of the other of the compartments; and
C. combining means connected to the barrier means for selectively applying a twisting motion to the barrier means and separating the barrier means completely from the container means, permitting the selective communication with one another by an external force of the compartments formed by

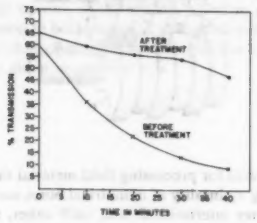
the barrier means within the chamber of the container means, and allowing a substance within each of the compartments to intermix with a substance from each of the other compartments formed by the barrier means.

4,556,326

METHOD FOR TESTING AND TREATING STORED FUEL

George H. Kitchen, III, and Nancy E. Kitchen, both of 646 Lakeview Clr., Rio Rancho, N. Mex. 87124

Filed Oct. 9, 1984, Ser. No. 658,764
Int. Cl.[4] G01N *25/00*
U.S. Cl. 374—45 14 Claims



1. A method for testing samples of distillate fuels obtained from long-term storage tanks for such fuels comprising the steps of:

(1) heating the fuel sample to a preselected test temperature within about 3 to about 5 minutes;

(2) holding the fuel sample at a test temperature of from about 200° F. (93.3° C.) to about 340° F. (171.1° C.) for a sufficient period of time to accelerate the formation of agglomerates in the fuel sample;

(3) cooling the fuel sample to ambient temperature;

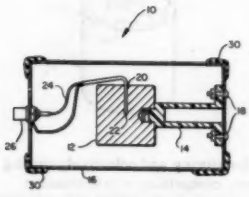
(4) measuring the percentage transmittance of ultraviolet through the fuel sample.

4,556,327

TEMPERATURE AVERAGING THERMAL PROBE

Lou F. Kalil, College Park, 86301, and Victor Reinhardt, Gaithersburg, both of Md., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Jan. 31, 1983, Ser. No. 462,508
Int. Cl.[4] G01N *25/68*
U.S. Cl. 374—115 7 Claims



1. A temperature averaging thermal probe for sensing the amplitude of long-term temperature fluctuations; comprising:

a closed housing (16) of a thermally conducting material;

a solid object (12) of a thermally conducting material positioned within said housing;

said housing being sealed to trap a mass of air therein and thereby preventing the transfer of heat directly between the environment outside of the housing and the solid object;

means (14) made of a thermally insulating material extending from an inside surface of said housing for holding said solid object inside and equidistantly spaced apart from all opposite interior surfaces of said housing thus assuring that no direct communication exists between the interior surfaces of the housing and the solid object;

means (22) embedded within said solid object for sensing heat; and

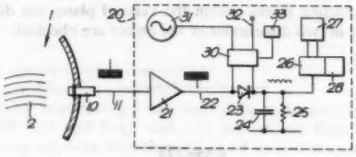
means (24, 26) for transferring a signal between said sensing means and the exterior of said housing.

4,556,328

RADIATION PYROMETER SYSTEM

Edward G. Orpet, 9 Stour Rd., Oakley, Basingstoke, Hampshire RG23 7AR, England

Filed Jan. 16, 1984, Ser. No. 571,267
Claims priority, application United Kingdom, Jan. 20, 1983, 8301513
Int. Cl.[4] G01J *5/00*
U.S. Cl. 374—144 8 Claims



3. A pyrometer system comprising: a radiation pyrometer that provides output signals that alternate between low value and high value in accordance with received radiation at low temperature and high temperature; a detection circuit including inverter means that inverts said output signals from the pyrometer so that low temperature radiation produces high value signals, unidirectional current means connected intermediate said inverter means and a capacitor means to allow passage of positive-going portions of the inverted output signals to charge said capacitor means, resistor means connected across said capacitor means for gradually discharging said capacitor means during negative-going portions of the inverted output signals so that the voltage across the capacitor means forms a first signal which is substantially representative of an average of the low temperature radiation signals, switching means connected across said unidirectional current means, means for closing said switching means at predetermined times so as to short-circuit said unidirectional current means thereby allowing passage of negative-going portion, of said inverted output signals to said capacitor means such that the voltage across said capacitor means follows substantially the output of the pyrometer and forms a second signal, and means supplying the voltage across the capacitor when connected to said inverter means via said unidirectional current means as a first signal to utilization means, and as a second signal to said utilization means at other times.

4,556,329

RESISTOR TEMPERATURE DEVICE TRIP UNIT

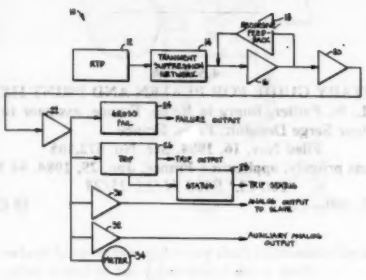
Michael R. Benson, and William D. Hill, both of San Jose, Calif., assignors to General Electric Company, San Jose, Calif.

Filed Dec. 1, 1982, Ser. No. 446,032
Int. Cl.[4] G01K *7/00*; G21C *17/00*
U.S. Cl. 374—173 18 Claims

1. A device for monitoring a parameter indicative of the status of a process comprising:

a sensor, located proximate to said process, providing a sensor output signal corresponding to process status, said sensor having a characteristic nonlinearity in the range of said parameter;

compensation means, coupled to said sensor, for compensating for said characteristic nonlinearity, said compensation means including an active recursive feedback network providing a bias signal to said sensor in response to said



sensor output signal so as to provide a compensated sensor signal linearly related to said parameter; and

means responsive to said compensated sensor signal providing at least one control signal for indicating process status.

4,556,330

RESISTANCE THERMOMETER AND LINEARIZATION CIRCUITRY

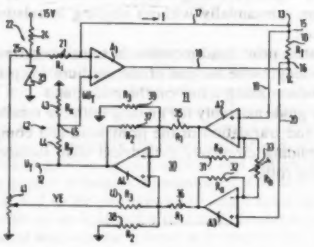
Paulus P. L. Regtien, Delft, Netherlands, assignor to Endress U. Hauser GmbH u. Co., Maulburg, Fed. Rep. of Germany

Filed Aug. 9, 1983, Ser. No. 521,532

Claims priority, application Fed. Rep. of Germany, Aug. 27, 1982, 3231996

Int. Cl.⁴ G01K *7/18*

U.S. Cl. 374—185 **5 Claims**



1. A resistance thermometer comprising a first operational amplifier having an inverting input, a non-inverting input and an output; a temperature-dependent measuring resistor having two current supply terminals and two voltage pick-up terminals separate from said current supply terminals, said temperature-dependent measuring resistor connected by said current supply terminals in a feedback loop from said output of said first operational amplifier to said inverting input of said first operational amplifier; means for applying a constant reference voltage via a resistor to said inverting input of said first operational amplifier; a differential amplifier having two inputs and an output; means for connecting said two inputs of said differential amplifier with said two voltage pick-up terminals, respectively; a voltage divider, having a tap, connected to said output of said differential amplifier, said voltage divider having a predetermined voltage divider ratio; and means for connecting said tap of said voltage divider with said non-inverting input of said first operational amplifier.

4,556,331

SUSPENSION DEVICE FOR ROTARY SPINDLE

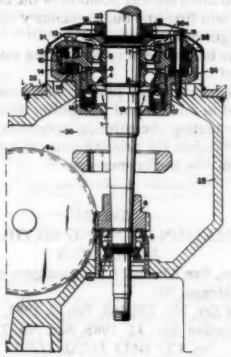
Jan C. Munde, Gnesta, and Karl Laigar, Bandhagen, both of Sweden, assignors to Alfa-Laval Separation AB, Tumba, Sweden

Filed Apr. 16, 1984, Ser. No. 600,375

Claims priority, application Sweden, Apr. 22, 1983, 8302301

Int. Cl.⁴ F16C *27/04*

U.S. Cl. 384—453 **6 Claims**



1. In combination with a frame and a rotary spindle having an axis, a device for suspending the spindle on the frame and comprising two separate but closely adjacent bearings surrounding different portions of the spindle, said bearings being an axial bearing and a radial bearing, respectively, a bearing housing divided into two rigid and relatively movable parts enclosing said axial and radial bearings, respectively, first spring means through which radial forces are transmitted to the frame from said housing part enclosing the radial bearing, and second spring means through which axial forces are transmitted to the frame from said housing part enclosing the axial bearing, said housing parts including means through which said parts engage each other to prevent movement of each part relative to the other in the peripheral direction of the spindle, said means being operable to allow free angular movements of the housing parts relative to each other around axes perpendicular to the spindle axis.

4,556,332

ELECTRONIC TYPEWRITER INCLUDING RIGHT MARGIN ADJUSTING MEANS

Motoi Maekawa, Shizuoka, Japan, assignor to Tokyo Electric Co., Ltd., Tokyo, Japan

Filed Jun. 27, 1983, Ser. No. 508,493

Claims priority, application Japan, Mar. 3, 1983, 58-34946

Int. Cl.⁴ B41J *5/30*

U.S. Cl. 400—3 **11 Claims**

1. An electronic typewriter, comprising:

a keyboard for generating printing data including space data and word data including at least one character data;

means for presetting a right margin position;

a first line buffer memory for sequentially storing the generated printing data from said keyboard;

means for counting a storage position of the printing data stored in said first line buffer memory;

means for discriminating if the printing data which is stored last in said first line buffer memory is a character data included in said word data when the counted storage position reaches said preset right margin position;

means for reading out all the printing data of one line lastly stored in said first line buffer memory, except for the character data which is stored last in said first line buffer memory, when said discriminating means discriminates that the counted storage position of the character data last stored in said first line buffer memory reaches said preset right margin position;

a second line buffer memory for storing said read out printing data of one line;

a printing mechanism for printing the printing data of one line stored in said second line buffer memory; and

means for actuating the printing operation of said printing mechanism when the printing data of one line is stored in said second line buffer memory.

4,556,333

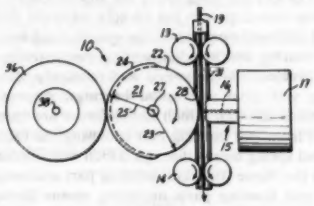
INFORMATION PRINTING METHODS AND APPARATUS

Rafn Stefansson, San Marino, Calif., assignor to Bell & Howell Company, Chicago, Ill.

Continuation of Ser. No. 230,468, Feb. 2, 1981, abandoned. This application Apr. 12, 1985, Ser. No. 722,423

Int. Cl.⁴ B41J *11/20, 11/057*

U.S. Cl. 400—58 **18 Claims**



1. In a method of printing information from a print head employing a preferred print gap on a sheet of material, the improvement comprising in combination the steps of:

providing a circular platen with a first peripheral portion having a first radius and a second peripheral portion having a second radius exceeding said first radius;

mounting said circular platen for rotation about an axis adjacent said print head;

providing a sheet transport path for conveyance of said sheet past said print head;

providing in said sheet transport path a sheet entry gap between said platen and said print head by moving said first peripheral portion about said axis into first proximity to said print head;

entering said sheet in said sheet transport path and in said entry gap between said platen and said print head;

maintaining said sheet transport path free of any obstruction during entry of said sheet in said sheet transport path and sheet entry gap;

providing said preferred print gap from said print head relative to said entered sheet by moving said second peripheral portion about said axis into second proximity to said print head at said entered sheet, said second proximity being smaller than said first proximity;

printing said information with said print head onto said sheet at said print gap; and

continuing to maintain said sheet transport path free of any obstruction above and below said print gap as seen transversely to the direction of transport of said sheet, and maintaining for all portions of said sheet transport path above and below said print gap a width greater than the width of said print gap throughout entry of said sheet into said print gap and during said printing of information onto said sheet.

4,556,334

UNITARY GUIDE FOR PLATEN AND PRINT HEAD

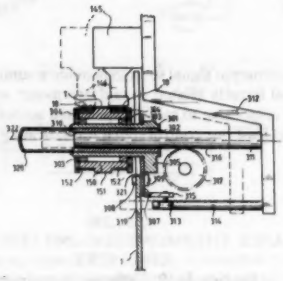
Alain L. N. Pailler, Bourg la Reine, France, assignor to Electronique Serge Dassault, Paris, France

Filed Nov. 16, 1984, Ser. No. 672,185

Claims priority, application France, Jun. 29, 1984, 84 10380

Int. Cl.⁴ B41J *11/22, 25/28*

U.S. Cl. 400—124 **18 Claims**



1. A printer for printing on a narrow print-receiving medium to be passed in a lengthwise direction through the printer, the printer comprising:

supporting means comprising a cylindrical roller having a cylindrical surface, the roller being rotatable about an axis thereof whereby the cylindrical surface moves with the medium substantially without slipping in relation to the medium;

a dot matrix print head movable in translation transversely to the lengthwise motion of the medium for printing on the medium along a line on the roller; and

a unitary guide assembly for guiding both the rotation of the roller and translation of the print head and comprising a head-guiding circularly cylindrical slide surface coaxial with the roller.

4,556,335

PRINT WHEEL MOUNTING MEANS

Lyle E. Morris, San Ramon, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed May 14, 1984, Ser. No. 610,546

Int. Cl.⁴ B41J *1/24, 1/30*

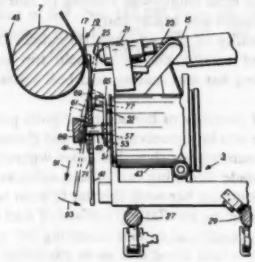
U.S. Cl. 400—144.2 **2 Claims**

1. A means for mounting a print wheel for rotation on a print wheel motor drive shaft which comprises:

a connector attached to the motor drive shaft for rotation therewith, said connector including channels;

a print wheel having a bore and print wheel fasteners formed integrally in said print wheel, said print wheel fasteners including pivot posts and flexible pivot post supports, said pivot posts adapted to be spring-locked for pivoting motion in said channels by said flexible pivot post supports, said pivot posts being lockable in said channels with said print wheel bore removed from said drive shaft said pivot

posts when locked in said channels defining an axis about which said print wheel can be pivoted to slide said print



wheel bore on the said drive shaft frictionally locking said print wheel to the print wheel drive shaft.

4,556,336

PEN CORE FOR WRITING INSTRUMENT

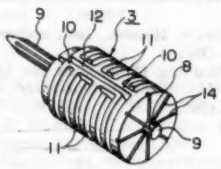
Tsunenori Sano, and Kazuo Kawaguchi, both of Kanagawa, Japan, assignors to Pilot Man-Nen Hitsu Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 1, 1984, Ser. No. 616,041

Claims priority, application Japan, Jun. 3, 1983, 58-84988[U]; Jul. 29, 1983, 58-119410[U]

Int. Cl.⁴ B43K *8/02, 3/00*

U.S. Cl. 401—199 **3 Claims**



1. In a pen core for a writing instrument having an ink conducting core for conducting ink to a writing member thereof and a barrel with an ink reservoir, said barrel being fitted on the outer wall of a pen core body, the improvement wherein: an annular groove in the form of a single continuous passageway is formed in the outer wall of said pen core body, said annular groove having a front end connected to an ink sucking groove which is communicated with said ink conducting core, and an air passageway having a front end communicated with an air hole and a rear end communicated with the rear end of said annular groove is formed in the outer wall of said pen core body without crossing said annular groove;

wherein said annular groove has the form of a single continuous passageway formed in the outer wall of said pen core body, said continuous passageway being bent and turning in a labyrinth structure and leaving banks, and wherein said air passageway is formed in a longitudinal one of said banks.

4,556,337

CONNECTOR FOR FRAMING SYSTEM

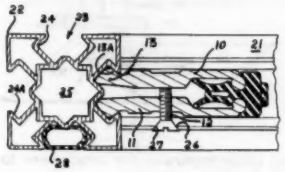
Stuart R. Marshall, Brighton, Australia, assignor to Framelock International Pty. Limited, Forestville, Australia

Filed Mar. 7, 1983, Ser. No. 473,095

Int. Cl.⁴ B25G *3/00*

U.S. Cl. 403—255 **8 Claims**

1. A connector for interconnecting first and second tubular members, wherein the first tubular member has an axially extending central cavity with opposed substantially flat walls and the second tubular member has a laterally directed undercut recess in a side wall for engagement with the connector, the connector comprising first and second substantially rigid legs each of generally strip-like form and having a head portion at one end, a body portion and a tail portion at the opposite end, a connecting element interconnecting the legs and permitting relative movement thereof, whereby the legs can be pressed apart in a clamping operation by a screw having its shank inserted through a side wall of the first tubular member, and each leg including a substantially flat abutment surface adapted to be pressed into abutment with one of the substantially flat opposed walls of the central cavity of the first tubular member, at least a rear portion of said abutment surface being adjacent the tail portion; the connector is characterised by the



connecting element interconnecting the rigid legs at the tail portions thereof, the tail portions of the legs having respective bulbous projections directed towards one another and the connecting element being a resilient structure and having complementary push fit interengagement cavities permitting assembly with the bulbous projections in a push fit operation and permitting motion of the legs relative to one another and relative to the connecting element such that the legs can move towards and away from one another, the connecting element providing biasing means for biasing apart said legs and the connecting element permitting said rear portions to be displaced away from one another for clamping the connector within the first tubular member.

4,556,338

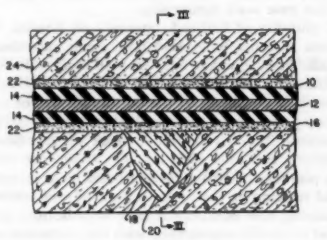
METHOD FOR REINFORCING PAVEMENT

Dennis M. Fahey, Lexington, N.C., assignor to Tar Heel Technologies, Inc., Lexington, N.C.

Filed Jul. 11, 1983, Ser. No. 512,186

Int. Cl.⁴ E01C *5/18;* B32B *25/02*

U.S. Cl. 404—28 **18 Claims**



1. A method for repairing and reinforcing pavement comprising the steps of selecting members of a special class of high performance, high tensile strength cords known as tire cords, said cords comprising filaments gathered and twisted to form a strand having a tensile strength between about 90 and 300 pounds, embedding and bonding a plurality of said cords in a substantially parallel manner into an elastomer to form a unidirectionally reinforced elastomeric membrane, placing at least one such membrane across the cracks or filled holes in a cracked but repairable road surface so that the cords of the reinforcement are in the direction of the stresses responsible for the cracks or holes and bonding with a thermosetting

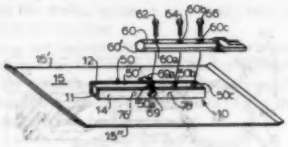
cement said membrane securely in place either prior to or simultaneously with final repaving of the road surface with asphalt.

4,556,339

ROTARY TROWEL BLADE ASSEMBLY

Donald R. Morrison, 6228 Eagle Peak Dr., Charlotte, N.C. 28214

Filed Nov. 7, 1984, Ser. No. 669,027
Int. Cl.[4] E01C *19/22*
U.S. Cl. 404—112 **4 Claims**



1. Trowel blade apparatus for attachment to a concrete troweling machine, comprising:

(a) a solid drive arm of the type having a drive mounting end and a blade mounting end with a flat bottom mounting surface and a plurality of spaced apart bolt receiving holes passing through said blade mounting end;

(b) a trowel blade having:

(i) a flat rectangular body portion with flat bottom and top surfaces;

(ii) two parallel working edges on opposite sides of said body portion; and

(iii) a plurality of spaced apart bolt holes aligned along the central long axis of said body portion and having countersunk entrances on the bottom surface thereof;

(c) an elongated integrally formed U-shaped bracket having:

(i) a flat base wall with flat bottom and top surfaces;

(ii) a pair of opposed flat side walls extending outwardly from said base wall;

(iii) a plurality of spaced apart bolt holes aligned along the central axis of and formed in said base wall mating said holes in said blade body portion; and

(iv) at least one pair of opposing pin receiving holes formed in said side walls intermediate of the length thereof;

(d) a plurality of bolt assemblies corresponding in number to said plurality of bolt holes in said blade body portion and bracket base wall, comprising:

(i) a plurality of flathead, countersunk headed, threaded plate securing bolts, said bolts being mounted in said blade body portion and bracket base wall bolt holes with said countersunk heads mated to said countersunk bolt hole entrances on the bottom surface of said blade body portion such that the flat heads of the bolts tend to continue the flat bottom surface of said blade body portion; and

(ii) a plurality of nuts secured to said plate securing bolts and residing on the upper surface of said base wall and securing said bracket flat base wall bottom surface to said blade flat top surface with the central axis of said bracket base wall aligned substantially parallel to the said working edges of said blade and located substantially midway therebetween;

(e) an elongated solid mounting bar adapted to snugly fit within said bracket and having:

(i) flat top, bottom and side surfaces;

(ii) a length substantially equal to the length of said bracket;

(iii) at least one pin receiving hole passing through said bar from side-to-side and adapted to be mated with an opposed pair of said pin receiving holes in said bracket side walls;

(iv) a plurality of recesses formed in said bottom surface of said bar located such that when said flat bottom surface of said mounting bar rests on the said top flat surface of said bracket base wall said recesses are adapted to receive and substantially cover said nuts and said nuts serve to limit lengthwise shifting of said bar relative to said bracket and blade; and

(v) a plurality of spaced apart threaded holes located in one end portion and in the said top surface of said mounting bar and mating said bolt holes in said drive arm;

(f) a second plurality of bar securing bolts passing through said drive arm bolt receiving holes and threadably secured in said mounting bar threaded holes whereby to securely join the blade mounting end of said drive arm to one end of said mounting bar with the flat bottom surface of said drive arm facing the flat top surface of said mounting bar and the opposite end of said mounting bar extending outwardly from said drive arm as an extension thereof; and

(g) a quick release fastener having:

(i) a pin fitted to and loosely mounted in and passing through said mated bracket and mounting bar pin receiving holes whereby to releasably secure said mounting bar in a snug fit to said bracket and thereby to said blade and to retain said mounting bar in a position to allow said bar bottom surface recesses to cover said nuts and the threaded connections between said nuts and said plate securing bolts; and

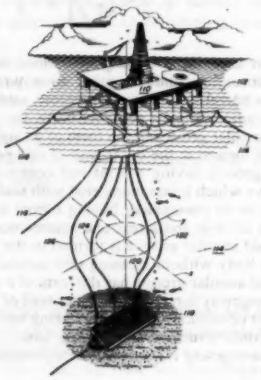
(ii) means for releasably holding said pin in said pin receiving holes.

4,556,340

METHOD AND APPARATUS FOR PRODUCTION OF SUBSEA HYDROCARBONS USING A FLOATING VESSEL

Arthur W. Morton, Houston, Tex., assignor to Conoco Inc., Ponca City, Okla.

Filed Aug. 15, 1983, Ser. No. 523,315
Int. Cl.[4] E21B *17/01*
U.S. Cl. 405—195 **2 Claims**



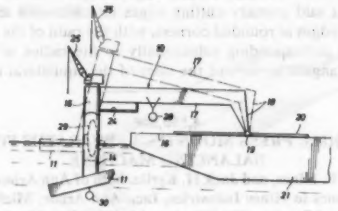
1. In a system for the production of hydrocarbon fluids from a subsea well including at least one well head having a riser connection, a moored, floating production vessel located at the surface of the body of water, and at least one flexible production riser extending between said well head riser connection and said vessel, said flexible riser being substantially neutrally buoyant and further including biasing means on said riser for shaping said riser in an oriented, broad arc, said biasing means including a control bundle disposed on one side of said riser bundle, whereby the passage of gravity-motivated wireline well service tools between said vessel and said well is permitted.

4,556,341

WORK PLATFORM

Ray R. Ayers, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Continuation of Ser. No. 443,095, Nov. 19, 1982. This application Feb. 19, 1985, Ser. No. 701,816
Int. Cl.⁴ E02D *21/00*
U.S. Cl. 405—195 **6 Claims**



1. A method for providing a floating offshore heliport comprising:

providing a semisubmersible platform having flotation means beneath one side and pivotally attachable connection means on the opposite side, the platform being located substantially above the reach of wave action and being supported by columns extending downwardly to the flotation means which is located substantially beneath the influence of the wave action, whereby the platform does not substantially react to the wave action; and

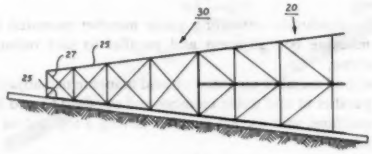
attaching the platform to the offshore structure via the connection means.

4,556,342

METHOD OF FABRICATING A BROAD-BASED SUBMERSIBLE STRUCTURE

Clifton A. Tannahill, Houston, Tex., assignor to Union Oil Company of California, Los Angeles, Calif.

Filed May 8, 1984, Ser. No. 609,101
Int. Cl.⁴ E02D *21/00, 25/00*; B23P *21/00*
U.S. Cl. 405—203 **21 Claims**



1. A method for fabricating a broad-based submersible structure having an upper portion and a lower portion and useful for deep water installations by:

(a) fabricating a first half-section of the lower portion of said broad-based submersible structure in a horizontal position,

(b) fabricating a second half-section of the lower portion of said broad-based submersible structure, in a horizontal position, adjacent said first half-section,

(c) raising said first half-section from the ground to a height sufficient to enable said second half-section to be moved therebeneath,

(d) moving said second half-section beneath said raised first half-section,

(e) aligning said second half-section with said raised first section,

(f) joining said aligned half-sections to provide said lower portion,

(g) joining said lower portion to the upper portion to provide said broad-based submersible structure in a horizontal position, and

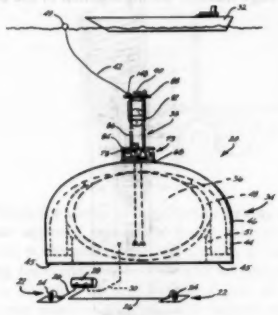
(h) rotating said broad-based, submersible structure from said horizontal position to a generally vertical position.

4,556,343

OFFSHORE OIL STORAGE AND TRANSFER FACILITY

Maxwell C. Cheung, 8 Sycamore Creek, Irvine, Calif. 92715

Filed Feb. 10, 1984, Ser. No. 579,157
Int. Cl.⁴ E02D *29/00*
U.S. Cl. 405—210 **28 Claims**



1. An offshore oil storage and transfer facility adapted to be disposed underwater comprising:

a dome including an inner wall defining a closed chamber to receive and store oil and an outer wall spaced outwardly from the inner wall to define a closed pocket disposed about the chamber, said inner wall including an uppermost hole to provide communication between the chamber and pocket and the outer wall including a lowermost port to provide communication between the pocket and the water;

a conduit adapted to extend from the chamber upward for unloading the oil from the chamber to a vessel; and

a bubble of compressed gas adapted to shift between the pocket and the chamber to urge the oil from the chamber through the conduit to the surface for transferring of the oil to a surface tanker and to shift from the chamber to the pocket in response to filling of the chamber with oil.

4,556,344

COMBINATION EXPANSION SHELL AND RESIN SECURED MINE ROOF ANCHOR ASSEMBLY

Claude C. White, Birmingham, Ala., assignor to Birmingham Bolt Company, Birmingham, Ala.

Continuation of Ser. No. 312,009, Oct. 16, 1981, abandoned. This application Feb. 13, 1984, Ser. No. 578,316
Int. Cl.⁴ E21D *20/02*
U.S. Cl. 405—261 **9 Claims**

1. A mine roof anchor assembly in combination with a dual compartment resin and cartridge inserted into a mine roof opening, the anchor assembly including:

(a) an elongated bolt having a head at one end and threaded for a portion of its length at the other end

(b) an expansion member engaged with the threaded end of said bolt

(c) said expansion member including an expansion shell, a bail member connected to said expansion shell, said bail member being in overlying contiguous engagement with the threaded end of said bolt

(d) a first means adjacent said expansion member carried by, and rotatable with, said elongated bolt for mixing the resin and catalyst upon rotation thereof

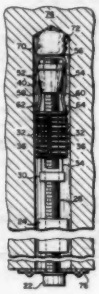
(e) the resin and catalyst cartridge being ruptured by said assembly when it is forced upwardly into the mine roof

opening, thereby permitting the resin and catalyst to gravitate downwardly between the wall of the mine roof opening and said first means, the resin and catalyst being mixed together upon rotation of said first means

(f) said expansion shell frictionally engaging the wall of the mine roof opening during rotation of the elongated bolt and said first means to hold the expansion member stationary, and

(g) a wedge member threaded on said elongated bolt for engagement with said expansion shell, to urge the latter into gripping engagement with the mine roof

(h) a second means for preventing rotational movement of said wedge member during rotation of the bolt, whereby,



when said bolt is rotated, said wedge member is threaded longitudinally of the bolt into expanding engagement with said expansion shell

(i) said wedge member in its entirety being initially positioned on said elongated bolt in longitudinally spaced relation to said expansion shell, the distance between said wedge member and said expansion shell being determined by the number of revolutions required to properly mix the resin and catalyst to act as a setting agent, after which continued rotation of said elongated bolt in the same direction effects activation of said expansion shell into gripping engagement with the roof, with resultant tensioning of the elongated bolt.

4,556,345

MULTI-CORNERED REVERSIBLE CUTTING-PLATE

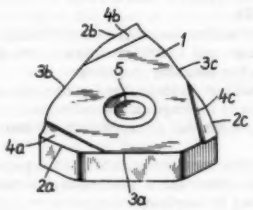
Engelbert Philippi, Saarwellingen, Fed. Rep. of Germany, assignor to Fried. Krupp Gesellschaft mit beschränkter Haftung, Essen, Fed. Rep. of Germany

Filed Jan. 18, 1984, Ser. No. 572,653

Claims priority, application Fed. Rep. of Germany, Feb. 1, 1983, 3303263

Int. Cl.[4] B23P *15/28;* **B26D** *1/00;* **B23B** *27/02, 27/22*

U.S. Cl. 407—114 **7 Claims**



1. A multi-cornered reversible cutting plate of the type having an upper side and a lower side, each of the upper and lower sides having a plurality of primary and secondary cutting edges of different lengths, said cutting plate being configured substantially as a nine-sided polygon formed by an equilateral triangle whose vertex regions have been symmetrically replaced by equal isosceles triangles having apex angles that are larger than the angles of an equilateral triangle, the primary cutting edges being disposed in the regions of the isosceles triangles and being shorter than the secondary cutting edges, wherein the improvement comprises: that the ratio of the length of each of said primary cutting edges to the length of each of said secondary cutting edges ranges from 1:1.5 to 1:3, and that said primary cutting edges intersect said secondary cutting edges at rounded corners, with the radii of the rounded corners corresponding substantially to the radius of a circle that is tangent to each of the sides of the equilateral triangle.

4,556,346

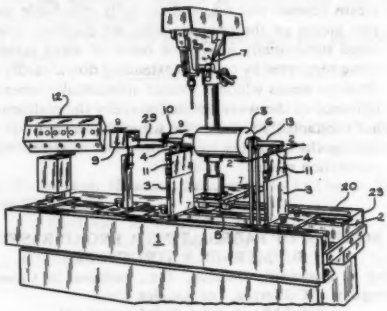
DRILL PRESS MOUNTING APPARATUS FOR BALANCING MACHINE

Gordon E. Hines, and Jack H. Kerlin, both of Ann Arbor, Mich., assignors to Hines Industries, Inc., Ann Arbor, Mich.

Division of Ser. No. 253,288, Apr. 13, 1981, Pat. No. 4,406,164. This application Sep. 16, 1983, Ser. No. 521,141

Int. Cl.[4] B23B *39/14*

U.S. Cl. 408—88 **5 Claims**



1. A drill press mounting apparatus for use on a balancing machine having a longitudinally extending machine bed, comprising:

a longitudinally extending guide member mounted on said machine bed adjacent and parallel to said balance machine;

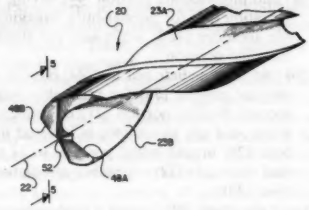
a second member mounted on said machine bed adjacent and parallel to said guide member and opposed to said balance machine, said second member having a top and an underside;

a slide member supported for rotation about and longitudinal travel along said guide member and further supported for movement between a first position in contact with said underside of said second member for longitudinal travel along said second member and a second position in contact with said top of said second member for retarding longitudinal travel along said guide member and said second member; and

a drill press positioned atop said slide member for movement of said slide member from said first position to said second position upon operation of said drill press, said drill press having its center of mass located between said balance machine and said guide member when said slide member is in said first position, the operation of said drill press generating a torque which shifts the center of mass of said drill press from a point between said balance machine andsaid guide member to a point between said guide member and said second member thereby causing said slide member to shift from said first position to said second position and cessation of the operation of said drill press causing said

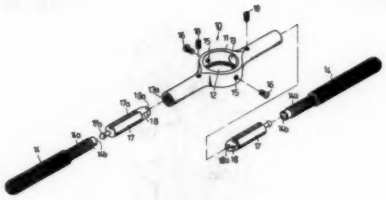
slide member to return from said second position to said first position.

4,556,347
SPLIT-POINT TWIST DRILL
Herman B. Barish, Woodland Hills, Calif., assignor to Lockheed Corporation, Burbank, Calif.
Filed May 11, 1984, Ser. No. 609,362
Int. Cl.[4] B23B *51/02*
U.S. Cl. 408—230 **8 Claims**



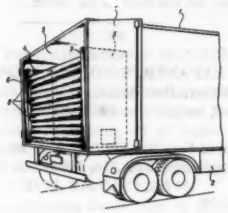
1. A split-point, two-fluted twist drill having:
a web thickness at the point prior to splitting of between 36 and 40 percent of the drill diameter;
a point angle of between 132 and 138 degrees;
a web taper from said point to flute run out of 0.032 to 0.038 inches per inch;
a chisel-edge angle of between 115 and 121 degrees; and
a splitting angle of between 128 to 137 degrees.

4,556,348
COMBINED TAP AND DIE HOLDER
Mou T. Liou, No. 33, Shi Hoo Rd., Da Li Village, Taichung District, Taiwan
Filed May 17, 1984, Ser. No. 611,410
Int. Cl.[4] B23G *1/44*
U.S. Cl. 408—233 **1 Claim**



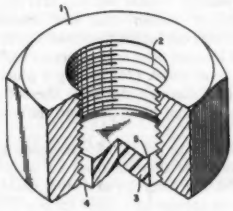
1. A combined cap and die holder, comprising a housing having a circularly cylindrical recess, first and second tubular recesses extending outwardly from each respective side of the circular recess, a clamping member slidable in respective tubular recesses each having a notch at respective ends facing the circular recess, a handle threadably engaged in each tubular recess and connected to each respective slide and being movable axially in said tubular recess to advance said slide in selected axial directions in accordance with the direction of rotation of the threading of its associated handle, a circularly cylindrical die engageable in said circularly cylindrical recess, a clamp threaded through said housing and engageable with said die to hold said die tightly in said cylindrical recess, a tap having an angle clamping end positionable in said circular recess, said handles being threadable to advance said clamping members inwardly into engagement with the angle clamping end of said tap when said die is removed from said circular recess.

4,556,349
PARTITION FOR A CARGO CARRIER FOR BULK FREIGHT
Willem Koudstaal, Vinkeveen, and Willem L. Streefkerk, Zeist, both of Netherlands, assignors to Koninklijke Emballage Industrie Van Leer B.V., Amstelveen, Netherlands
Filed Apr. 29, 1983, Ser. No. 489,762
Int. Cl.[4] B60P *7/14*
U.S. Cl. 410—140 **10 Claims**



1. A partition for use in a cargo carrier having an unloading opening and opposed inner side walls, said partition being adapted to be positioned inside said carrier, at the location of said opening, for containing bulk freight, wherein said partition comprises a plurality of profiles and a pair of supports for supporting said profiles, wherein each support includes:
a plate, the height of which corresponds substantially to the height of the partition, said plate having a dimension that, when placed against an inner wall of a cargo carrier, the lateral force of bulk cargo presses the plate against said wall with force sufficient to hold the plate by friction; and
a hollow vertical member flexibly attached to said plate along a vertical edge thereof, for movement about a vertical axis, wherein the hollow vertical members include support means for detachably engaging said profiles for horizontally positioning said profiles in superposed relation, and wherein said support means are spaced inwardly of said plates when said plates are positioned against opposed side walls such that force of bulk cargo against said profiles imparts a moment of torque on said hollow vertical members outwardly about their respective axes to press into the side walls of the carrier.

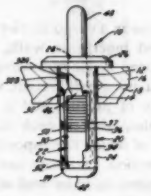
4,556,350
MINE ROOF ANCHOR BOLT
Frederick W. Bernhardt, and John E. Schott, both of C/- Chemfix Pty. Limited, 102 Albatross Rd., Nowra, New South Wales, Australia (2540)
Filed May 7, 1982, Ser. No. 376,172
Int. Cl.[4] F16B *31/02*; E21D *20/02*
U.S. Cl. 411—10 **1 Claim**



1. In a mine roof anchor bolt assembly the improvement comprising:
(a) a nut for threaded attachment to the end of the bolt protruding from the mine roof,

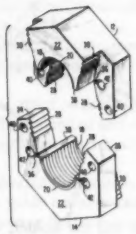
(b) a bore of uniform diameter running from top to bottom of said nut along the central axis of said nut,
(c) said bore having internal threads from the top to the bottom of said bore,
(d) a resin plug at the bottom of the bore,
(e) said resin plug chemically bonded to the bore of the nut, whereby the bolt is initially rotated by the nut and the plug until a pre-determined rotational torque is achieved and then the nut is rotated relative to and is advanced axially along the bolt when the chemical bond of the resin plug is broken, to tighten the nut on the roof of the mine.

4,556,351
EXPANSION RIVET ASSEMBLY
Burnell J. Wollar, Barrington, Ill., and Richard J. Schwind, Akron, Ohio, assignors to Phillips Plastics Corporation, Phillips, Wis.
Continuation of Ser. No. 371,652, Apr. 26, 1982, abandoned. This application Nov. 16, 1984, Ser. No. 672,152
Int. Cl.[4] F16B *13/06*
U.S. Cl. 411—38 **2 Claims**



1. A two-piece expansion rivet assembly (10) for permanent installation in a hole (12,14) which extends between an outer surface and an inner surface of a workpiece, said workpiece comprising one or more components (16,18), said expansion rivet assembly (10) comprising:
I. a hollow expandable plastic rivet (20) comprising:
(A) an elongated rivet shank (24) of predetermined outside diameter and having a head end and an insertion end (39), insertable through said hole (12,14) from said outer surface,
(B) and an external flange (26) near said head end for engaging said outer surface of said workpiece when said rivet shank (24) is fully inserted through said hole (12,14);
(1) said rivet shank (24) having an axial bore (28) therethrough which includes
(a) an intermediate portion (30) of predetermined inside diameter,
(b) a first portion (32) of first reduced diameter smaller than said predetermined inside diameter and located near said head end having at least one annular groove (32A) defining a flexible shoulder (32B);
(c) a second flexible portion (21) of second reduced diameter smaller than said predetermined inside diameter but larger than said first reduced diameter and located near said insertion end,
(2) said rivet shank (24) having a plurality of perforations (34) through the sides thereof communicating with said axial bore (28) and defining flexible rivet shank walls (36);
II. and a plastic drive pin (22) for association with said rivet (20) and movable thereon from an initial position to an installed position whereby said rivet shank walls (36) flex outwardly to engage said inner surface of said workpiece and comprising:
(A) an elongated pin shank (40) having a flange end and an insertion end,
(B) and an external flange (42) near said flange end of said pin shank (40) for engaging said insertion end (39) of said rivet shank (24) when said drive pin (22) is inserted from said insertion end of said rivet (24) into said initial position and having an outside diameter which is not greater than said predetermined outside diameter of said rivet shank (24);
(1) said pin shank (40) having an intermediate portion (44) near said flange end thereof which is of slightly larger diameter than that of said second flexible portion (21) of said axial bore (28), which is of larger diameter than that of said first portion (32) of said axial bore (28) and is of smaller diameter than intermediate bore portion (30),
(a) said intermediate portion (44) having at least one serration (50) for permanently engaging said flexible shoulder (32B) when said pin shank (40) is in installed position
(b) said intermediate portion (44) having at least one annular groove (52) for releasably engaging said second flexible portion (21) of reduced diameter when said pin shank (40) is inserted in said axial bore (28) in said initial position so as to maintain said drive pin (22) releasably associated with said rivet (20),
(2) said pin shank (40) having a tool-engageable breakaway portion (48) which is of smaller diameter than that of said first portion (32) and which extends through and outwardly of said first portion (32) of said axial bore (28) when said drive pin (22) is in said initial position,
(3) said pin shank (40) having a break-away indentation (46) between said intermediate portion (44) and said break-away portion (48) thereof whereby said breakaway portion (48) is detachable from said intermediate portion (44) when axial tensile force is applied to said breakaway portion (48) by a tool.

4,556,352
SHAFT-MOUNTED SNAP LOCK ASSEMBLY
Herbert Resnicow, East Williston, N.Y., assignor to American Snap Nut Association, East Williston, N.Y.
Filed Jan. 27, 1983, Ser. No. 461,652
Int. Cl.[4] F16B *17/00*
U.S. Cl. 411—433 **17 Claims**



1. A snap lock assembly operable to be radially mounted about a shaft without passing over an end of a shaft or sliding axially along a shaft, said assembly comprising first and second segments which are sized and shaped to encircle a shaft and which radially interlock with each other, each of said first and second segments comprising:
a body member having an arc portion defining part of a bore for the reception of at least a part of a shaft and having engaging means on the inner periphery of said part of a bore for at least partially engaging a member placed within the bore;
first and second circumferentially spaced shoulder portions, integral with said body member, and having longitudinally extending outwardly directed faces, which slope generally linearly away from an imaginary plane intersect-

ing an imaginary longitudinal axis of said arc portion, said imaginary plane further serving to divide said body member into identical portions on each side of said imaginary plane;

a plurality of rachet teeth formed upon each of said sloping faces of said first and second shoulder portions, said rachet teeth each including generally planar ramp portions and a recess at the end of each ramp and at the beginning of a next adjacent tooth;

first and second circumferentially spaced projections integral with and extending outwardly from said body member, said spaced projections having longitudinally extending, mutually opposing faces extending on opposite sides of the imaginary plane which slope generally linearly away from the imaginary plane; and

a plurality of rachet teeth extending from each of said mutually opposing faces of said first and second circumferentially spaced projections said rachet teeth each including generally planar ramp portions and a recess at the end of each ramp and the beginning of a next adjacent tooth wherein said rachet teeth of said first and second circumferentially spaced projections of said first segment operably engage with said rachet teeth of the faces of said first and second shoulder portions respectively of said second segment and said rachet teeth of said first and second circumferentially spaced projections of said second segment concomitantly engage with said rachet teeth of the faces of said first and second shoulder portions respectively of said first segment when said first and second segments may be radially snapped together to operably form a unified snap lock assembly about a shaft without passing over an end of the shaft or sliding axially along the shaft.

4,556,353

PROCESS AND APPARATUS FOR BINDING BOOKS

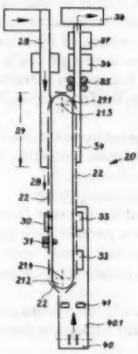
Hans-Dieter Ehlermann, Hinter dem Paschberg 8, D-2810 Verden-Scharnhorst, Niedersachsen, Fed. Rep. of Germany

Filed Nov. 10, 1983, Ser. No. 550,961

Claims priority, application Fed. Rep. of Germany, Nov. 10, 1982, 3241477

Int. Cl.⁴ B42C *11/00, 11/02, 11/08, 9/00*

U.S. Cl. 412—5 **24 Claims**



1. Process of binding books comprising gripping and holding a bookblock having first and last pages and a back by a forward portion of the bookblock spaced from the back while applying adhesive to rear portions only of first and last pages of the bookblock, providing a case comprising front and back covers and a connecting back, applying adhesive to forward portions of inner surfaces of said front and back covers, bringing said back and rear portions of said front and back covers of said case into engagement with the back and the adhesively coated rear portions of first and last pages of said bookblock while so held, whereby said case is adhered to a rear portion of said bookblock, supporting said bookblock with said case by a rear portion thereof while releasing said forward portion of said bookblock, bringing adhesively coated forward portions of said front and back covers into engagement with forward portions of said first and last pages of said bookblock and pressing said cover firmly on said bookblock to bond said front and back cover of said case throughout to first and last pages of said bookblock.

4,556,354

PROCESS FOR PRODUCTION OF BONDED CAN OF KEY-OPENING TYPE

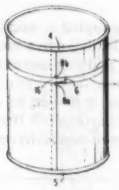
Michiko Tsurumaru, Tokyo; Seiichi Nakazato, Yokohama; Atsushi Nunokawa, Kawasaki; Hiroshi Ueno, Yokosuka, and Seishichi Kobayashi, Yokohama, all of Japan, assignors to Toyo Seikan Kaisha, Ltd., Tokyo, Japan

Division of Ser. No. 597,859, Apr. 9, 1984. This application Apr. 12, 1985, Ser. No. 722,474

Claims priority, application Japan, Apr. 9, 1983, 58-61534

Int. Cl.⁴ B23P *11/02*

U.S. Cl. 413—15 **1 Claim**



1. A process for the production of bonded cans of the key-opening type, which comprises the steps of (A) forming a plurality of scores for key-opening of a can on a metal can blank along the entire length of a surface to be formed into an outer surface of the can, said metal can blank being provided with a coating of an epoxy resin having a thermal softening point of 65° to 105° C. as measured according to the thermomechanical method, which is formed at least at a seam-forming part on the surface to be formed into the outer surface of the can, and said scores having a knife angle of 45° to 120° and a depth corresponding to 8 to 45% of the thickness of the metal blank, (B) applying a tape of a thermoplastic adhesive of a polyamide or polyester type on the end edge portion, to be formed into an inner side of a seam, of the metal blank to wrap and cover said end edge portion with said tape, (C) shearing the metal blank so that a tongue piece for key-opening of the can may be formed on the end edge portion, to be formed into an outer side of the seam, of the metal blank integrally therewith, and (D) forming the metal blank prepared through the steps (A), (B) and (C) into a can body, lapping the inner and outer end edge portions to each other through said adhesive tape, pressing the lapped end edge portions in the state where the adhesive is melted, and cooling and solidifying the adhesive to form a seam.

4,556,355

SINGLE LOOP LOAD/UNLOAD DRIVE ARRANGEMENT WITH LATCHING PUSH MEMBER FOR STORAGE AND RETRIEVAL SYSTEM

Michael Glater, New York, N.Y., assignor to Supreme Automation Corporation, Piscataway, N.J.

Filed Aug. 17, 1983, Ser. No. 524,033

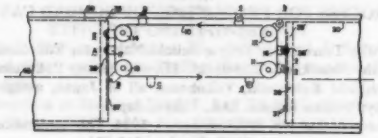
Int. Cl.⁴ B65G *1/04*

U.S. Cl. 414—280 **9 Claims**

1. An article transfer arrangement of the type wherein a plurality of articles are arranged at respective matrix locations, each open at a substantially vertical common access surface, the article transfer arrangement further having a transfer car-

riage movable to locations in the vicinity of selected matrix locations for supporting the articles when they are removed from the matrix locations, the article transfer arrangement further comprising:

a single flexible drive means arranged as a continuous driven loop on the transfer carriage and movable in two directions, said continuous loop having as pre-determined configuration and being arranged in a drive plane substantially parallel to an article support surface of the transfer carriage for conveying the articles inwardly and outwardly with respect to the associated matrix locations;



pull means coupled to said flexible drive means for engaging with a selected one of the articles for withdrawing said article from a matrix location as said flexible drive means is driven; and

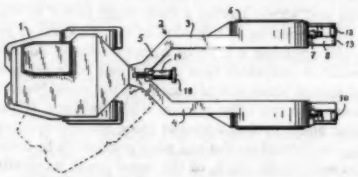
push and pull means coupled to said flexible drive means at a location on said flexible drive means distal from a location thereon where said pull means is coupled, for pushing a selected one of the articles into a matrix location as said flexible drive means is driven in one direction and for pulling said selected article out from said matrix location as said flexible drive means is driven in an opposite direction.

4,556,356

U-FRAME TRUCK

Karl-Erik Niva, Kiruna, Sweden, assignor to Kiruna Truck, AB, Sweden

Filed Aug. 24, 1982, Ser. No. 411,132
Claims priority, application Sweden, Aug. 24, 1981, 8104988
Int. Cl.⁴ B60P *1/16*
U.S. Cl. 414—458 **1 Claim**



1. A U-frame truck for lifting, transporting, and tilting a container, comprising:

a prime mover;

a trailer connected at its front end to said prime mover, said trailer having a U-shaped frame including parallel side frame portions and a connecting front middle-frame portion, said frame being open at its back portion;

a wheel unit connected to each side frame portion;

a back hydraulic cylinder mounted on each side frame portion and located adjacent the corresponding wheel unit;

a single-armed lever pivotally mounted at one end to each said side frame portion each said lever having an outer free end including rear engagement means adapted to cooperate with a corresponding complementary-shaped rear bracket on the container for lifting, transporting, and tilting the container, said engagement means being so positioned on said side frame as to prevent torsional stress on said side frame by the container;

at least one front hydraulic cylinder mounted on said middle-frame portion, said hydraulic cylinder having a piston rod carrying front engagement means adapted to cooperate with at least one complementary shaped front bracket on the container for lifting, transporting, and tilting the container;

pin means pivotally attaching each said single-armed lever to the lowest portion of its corresponding side frame portion and behind said wheel unit, each said single-armed lever having a load position wherein it extends essentially horizontally to engage a corresponding low position engagement point on the rear bracket of the container, the engagement point being the lift and transport point for the rear of the container and the tilt center of the container upon tilting thereof by operation of the front cylinder; and

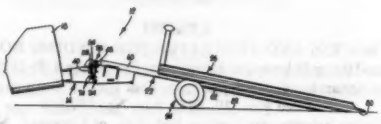
means connecting each said back cylinder to a corresponding one of said single-armed levers, whereby said back cylinders are operative to lift said single-armed levers in an arcuate motion about said pin means, through an arc of about 45° so that the back engagement means of each single-armed lever remains behind the wheel units while lifting and transporting the container in cooperation with the front cylinder.

4,556,357

TRUCK HAVING ARTICULATED CHASSIS FOR HAULING GOODS

Donald R. Landoll; David J. Kongs, and Alfred R. Belknap, all of Marysville, Kans., assignors to Landoll Corporation, Marysville, Kans.

Filed Apr. 16, 1984, Ser. No. 600,951
Int. Cl.⁴ B60P *1/20*
U.S. Cl. 414—469 **6 Claims**



1. In a self-propelled, automotive chassis having a front, cab-supporting frame and a rear, bed-supporting frame normally disposed in essentially end-to-end relationship to the front frame with both frames substantially horizontal, an articulation interconnecting the proximal ends of the frames for up and down tilting movement of both frames about a normally horizontal axis, power means pivotally connected to the rear frame for tilting the frames, and structure operably coupling the power means with the front frame, said structure comprising:

a system of linkages interconnecting the frames and coupled with said power means for tilting the frames upon actuation of said power means,

said system of linkages comprising:

link means mounted on the rear frame for swinging movement about an axis parallel with said horizontal axis;

means coupling the link means with said power means for swinging the link means upon actuation of the power means; and

a control link pivotally interconnecting the link means and the front frame for tilting the frames during swinging of the link means.

4,556,358

PORTABLE HOIST

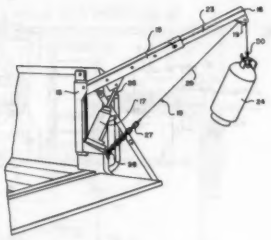
Burton C. Harlan, 6445 Kelsey Creek Dr., Kelseyville, Calif. 95451

Filed Feb. 24, 1983, Ser. No. 469,460
Int. Cl.⁴ B65G *67/02*
U.S. Cl. 414—550 **22 Claims**

1. A portable hoist comprising:

(a) a mounting for attachment to support means;

(b) an upright support structure;
(c) means connecting said support structure to said mounting for swinging movement about a vertical axis;
(d) a boom pivotally secured at one end to the upper end of said support structure whereby the free end of said boom can be raised to lift a load or lowered to engage or lower a load;
(e) means acting between said support structure and said boom to effect raising and lowering of said boom;



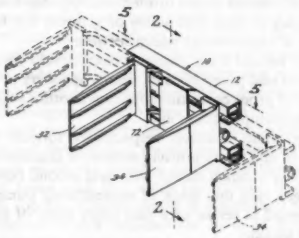
(f) a sheave carried at said free end of said boom; and
(g) a hoist line looped over said sheave, one end of said hoist line connected to the lower end of said support structure near the point where the base of said means for raising and lowering said boom is positioned along said support structure, said hoist line extending from said lower end of said support structure directly to said sheave at said free end of said boom, the other end of said hoist line having means for attachment to said load.

4,556,359

LOAD CARRYING CLAMP ATTACHMENT FOR A LIFT TRUCK

Stuart W. Sinclair, Lake Jackson, Tex., assignor to Anderson, Clayton & Co., Houston, Tex.

Filed Jul. 23, 1984, Ser. No. 633,731
Int. Cl.[4] B66F 9/18
U.S. Cl. 414—621 **10 Claims**



1. In a load carrying clamp attachment for use on a lift truck having a body adapted to be mounted on a lift truck, said body having a plurality of elongate vertically spaced parallel guides, each guide supporting a longitudinally movable slide, first and second load clamps connected to said slides for movement toward and away from each other for supporting and releasing a load, and first and second piston and cylinder assemblies connected to one of the load clamps for moving said clamps, the improvement comprising,

a ball and socket support supporting each of the assemblies from the body for automatically aligning the assemblies for reducing shock loads and binding to the assemblies if the attachment is shock-loaded, and

said support including means for limiting rotation of the assemblies and their longitudinal axis.

10. In a load carrying clamp attachment for use on a lift truck having a body adapted to be mounted on a lift truck, said body having a plurality of elongate vertically spaced parallel guides, each guide supporting a longitudinally movable slide, first and second load clamps connected to said slides for movement toward and away from each other for supporting and releasing a load, said first and second piston and cylinder assemblies connected to one of the load clamps for moving said clamps, the improvement comprising,

a bearing slipper telescopically engaging each end of each slide and telescopically movable in the guide supporting the slide for increasing the bearing support of the slide in the guide, and

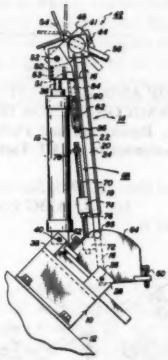
a stop in said guide on each side of the slipper for extending and retracting said slipper on the slide.

4,556,360

ROBOTIC APPARATUS

George T. Hoffmann, 680 Van Voorhis Ave., Rochester, N.Y. 14617

Continuation of Ser. No. 413,934, Sep. 1, 1982, abandoned. This application Jun. 3, 1985, Ser. No. 741,015
Int. Cl.[4] B66F 9/00
U.S. Cl. 414—701 **18 Claims**



1. Robotic apparatus which comprises an extensible passive arm pivotable on a first pivot, a wrist rotatably mounted on said arm, an extensible actuator pivotable on a second pivot, said actuator being pivotally connected to said wrist, means against which said actuator works for limiting the distance over which said arm rotates about said first pivot without extending or retracting, and means against which said actuator works for limiting the extension and retraction distances of said arm and enabling the rotation of said wrist whereby said arm and wrist execute a predetermined cycle of arm rotation, arm extension and wrist rotation as said actuator extends and retracts.

4,556,361

OPENER APPARATUS AND SYSTEM UTILIZING SAME

Donald S. Bartlett, Troy; John A. Boback, Warren, and Thomas M. Powell, Dryden, all of Mich., assignors to GMFanuc Robotics Corporation, Troy, Mich.

Filed Jan. 27, 1984, Ser. No. 574,472
Int. Cl.[4] B25J 5/02
U.S. Cl. 414—744 A **14 Claims**

1. An apparatus for moving a hinged member of a vehicle body about a hinge axis at a work station, the apparatus comprising:

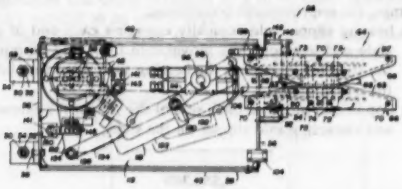
a base;

an arm having one end thereof mounted on said base for rotary movement about a first pivot axis;

a gripper mechanism mounted on the free end of said arm and adapted for seizing and releasing the hinged member;

a motor including an actuator shaft rotatable about a second pivot axis spaced apart from the first pivot axis; and

control linkage connected to said actuator shaft for transferring rotary motion of the actuator shaft to rotate said arm,



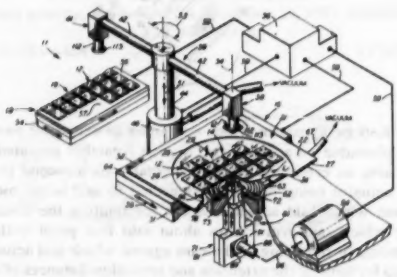
wherein said control linkage translates rotation of the actuator shaft at a substantially constant angular velocity to a rotation of said arm at a substantially sinusoidal angular velocity whereby the arm is accelerated and decelerated to move the hinged member in a relatively smooth fashion after said gripper mechanism seizes the hinged member.

4,556,362

METHODS OF AND APPARATUS FOR HANDLING SEMICONDUCTOR DEVICES

Norman Bahnck, Bethlehem, and Philip Kloap, Coopersburg, both of Pa., assignors to AT&T Technologies, Inc., Berkely Heights, N.J.

Filed Dec. 21, 1983, Ser. No. 563,726
Int. Cl.[4] A23G 9/00
U.S. Cl. 414—744 B **18 Claims**



1. A method of handling articles comprising:

holding an array of articles on an adhesively coated surface of a flexible diaphragm;

selecting an article from such array of articles for removal from the diaphragm;

contacting an underside of the diaphragm with a plurality of spaced support pins in peripheral regions within a vertical projection of the selected article onto the diaphragm;

moving the plurality of support pins in unison upward against the diaphragm, thereby retaining an orientation of the selected article parallel to the array while raising the article with respect to other articles in the array;

engaging the underside of the diaphragm with a pushpin at a center of the vertical projection of the selected article onto the diaphragm; and

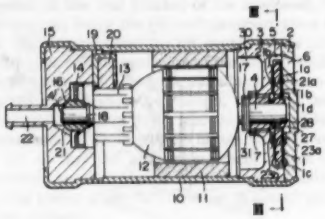
moving the pushpin upward with respect to the plurality of support pins to urge the article out of contact with the support pins.

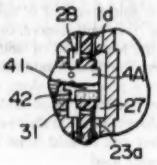
4,556,363

PUMPING APPARATUS

Kiyohiko Watanabe, Chiryu; Yoshiyuki Hattori, Toyoake; Toshiaki Nakamura, Anjo, and Shunsaku Ohnishi, Toyota, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Jun. 20, 1983, Ser. No. 505,849
Claims priority, application Japan, Jun. 21, 1982, 57-106392
Int. Cl.[4] F04D 5/00
U.S. Cl. 415—53 T **4 Claims**





1. A pumping apparatus comprising:

pump housing means having a pump chamber therein;

a rotary shaft supported in said pump housing means;

an impeller supported on and drive by said rotary shaft and rotatably disposed in said pump chamber;

a first series of grooves formed on both sides of said impeller at its outer periphery;

a second series of grooves formed on both sides of said impeller radially inwardly of said first series of grooves;

first flow channel means formed in said pump housing means opposing to said first series of grooves for forming one stage of regenerating pump section;

a pair of second flow channels respectively formed in side walls of said pump housing means opposing to said second series of grooves, to thereby form another stage of regenerating pump section; and

communicating channels respectively formed in the side walls of said pump housing means for communicating said first flow channel means with said second flow channels, whereby said one stage of regenerating pump section is connected in series with said other stage of regenerating pump section;

an inlet portion formed in said pump housing means and communicated to said first flow channel means;

a pair of spaces formed in said pump housing means and on both sides of said impeller at its center;

a pair of discharge channels respectively formed in side walls of said pump housing means for communicating said second flow channels with said spaces, respectively;

a through port in the form of a through hole formed in said impeller near said rotary shaft for communicating said spaces with each other;

a discharge port formed in said pump housing means and communicated with said spaces for discharging high pressure fuel out of said pump chamber; and

passage means formed in said rotary shaft, said passage means extending along the longitudinal axis of said rotary shaft and having opening means at one end communicating laterally outwardly of said rotary shaft, said passage

means being constructed and arranged for communicating one of said spaces with the other of said spaces.

4,556,364

CENTRIFUGAL PUMPS

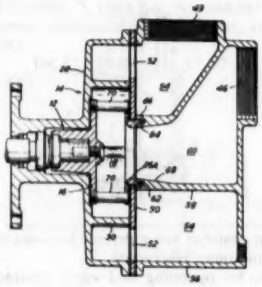
Michael D. Barker, Hunsdon, Nr. Ware, England, assignor to D. Wickham and Company Limited, Hertfordshire, England

Filed Jul. 21, 1982, Ser. No. 400,210

Claims priority, application United Kingdom, Jul. 23, 1981, 8122798

Int. Cl.⁴ F04D *17/08*

U.S. Cl. 415—170 A **20 Claims**



1. A centrifugal pump comprising a pump casing having a wall, an inlet opening in said wall and an outlet opening in said wall, an impeller mounted for rotation within said pump casing and having an opening at one side facing said inlet opening, an annular plate mounted to said impeller at said one side, a first radially-extending annular sealing surface on the inside of said casing wall surrounding said inlet opening, a second radially-extending annular sealing surface on said annular plate opposite to said first sealing surface, said first and second sealing surfaces defining radially disposed spaced parallel planer surfaces rotatable relative to each other and defining a radially-disposed annular gap uniform width between said casing wall and said impeller and a tubular sleeve extending from said annular plate through said inlet opening and located radially inwardly of said sealing surfaces, said tubular sleeve defining with said inlet opening an axially-disposed annular gap between said tubular sleeve and said inlet opening in communication with the inner end of said radially-disposed annular gap; the impeller being operable to draw medium being pumped the casing through said tubular sleeve and said impeller opening and discharge it through said annular gap casing outlet, the gap between said relatively rotating surfaces of the impeller and casing wall being such that when the pump is in operation, a continuous rotating film of media is maintained between the surfaces thereof which impedes the flow of media radially inwardly between said impeller and said casing while permitting discharge of any particles of grit or abrasive material. entrained in the media.

4,556,365

HUB PLATE FOR A HELICOPTER ROTOR, METHOD OF MANUFACTURING IT, AND A HELICOPTER ROTOR HUB EQUIPPED WITH PLATES

René L. Mouille, Le Coton Rouge, and Jean-Luc M. Leman, Aix-en-Provence, both of France, assignors to Societe Nationale Industrielle et Aerospatiale, Paris, France

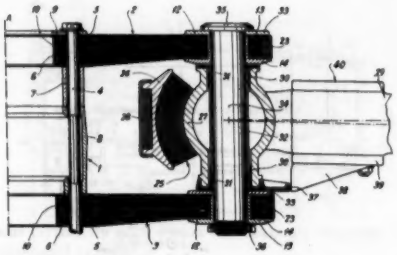
Filed Jul. 8, 1983, Ser. No. 512,002

Claims priority, application France, Jul. 8, 1982, 82 11988

Int. Cl.⁴ B64C *27/38*

U.S. Cl. 416—134 A **21 Claims**

1. A hub plate for a helicopter rotor hub for securing to the top portion of a rotor hub at right angles to its axis of rotation so as to connect rotor blades to a rotor shaft, the plate being made of a composite material and comprising a laminated disc constituted by layers of fibre cloth having high mechanical strength, characterized in that frame of the disc is constituted by aligned layers of cloth, wherein the weft or the warp of the cloth extends radially in the direction that corresponds to the direction of the centrifugal force acting on the plate when in



use, the aligned layers being positioned at the core of the laminated structure and, at least at the surface of the laminated structure in the peripheral portion of the disc, and in that the disc is enclosed by a belt of parallel threads consisting of fibres having high mechanical strength fitted on radially outwardly projecting parts of the disc in recesses formed in the outer edge of the parts, the recess being open to the exterior.

4,556,366

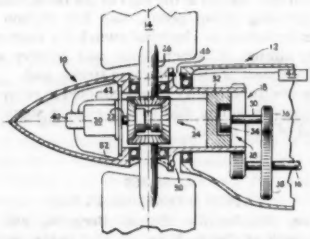
PROPELLER ACTUATION SYSTEM

Donald F. Sargisson, and Clifford M. Toraason, Jr., both of Cincinnati, Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed Oct. 17, 1983, Ser. No. 542,868

Int. Cl.⁴ B64C *11/44*

U.S. Cl. 416—155 **10 Claims**



1. In a propeller engine system having a rotatable hub including propeller blades, means for generating electric power within said hub for use with said blades comprising:

a rotor shaft extending into said hub, wherein said hub and said rotor shaft are differentially rotatable; and

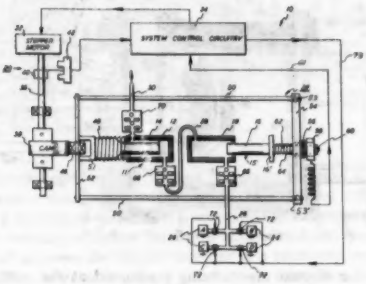
generator means including magnetic means fixed to said rotor shaft and winding means fixed to said hub for rotation therewith;

wherein said differential rotation induces an electric current in said winding means.

4,556,367
SOLVENT DELIVERY SYSTEM

Carl E. Schmid, Easton, Conn., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Continuation of Ser. No. 343,807, Jan. 29, 1982, abandoned. This application Jul. 20, 1984, Ser. No. 632,758
Int. Cl.⁴ F04B *3/00; 49/06*
U.S. Cl. 417—18 17 Claims



1. A fluid pumping system comprising:

a. a positive displacement delivery pump including a cylinder, a piston disposed for reciprocation in the cylinder and means defining inlet and outlet flow passages in communication with said cylinder;

b. drive means, including a motor, for imparting reciprocative motion to said piston characterized by a relatively slow advance stroke and rapid retraction stroke;

c. a positive displacement metering pump including a cylinder, a piston disposed for reciprocation in said cylinder and means defining inlet and outlet flow passages in communication with the cylinder;

d. unidirectional flow passage means hydraulically coupling the outlet flow passage of said metering pump cylinder to the inlet flow passage of said delivery pump;

e. electrically-actuated, fluid composition control valves selectively operable to control flow of fluid into said metering pump cylinder;

f. means including a lost motion coupling between the respective pistons of said pumps for imparting reciprocative motion to said metering pump piston 180° out of phase with the piston of said delivery pump, said lost motion coupling accommodating limited relative displacement between said pistons at the start of the retraction stroke of said metering pump piston, said lost motion coupling further including an electrical switch for controlling said motor, closure of which limits said relative motion to signal the start of said retraction stroke; and

g. system control circuitry means coupled to receive electrical signals including said switch closure signal to effect control of said valves.

4,556,368
VAPOR PRESSURE PUMP

Benoit Jean, Boucherville; Benoit Bergevin, and Fernand Rheault, both of Sainte-Julie, all of Canada, assignors to Soltrac, Inc., Montreal, Canada

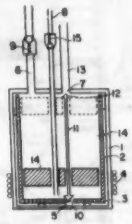
Filed Feb. 7, 1984, Ser. No. 577,772
Claims priority, application Canada, Dec. 2, 1983, 442469
Int. Cl.⁴ F04B *19/24;* F04F *1/18*
U.S. Cl. 417—208 22 Claims

1. A vapor pressure pump for delivering a liquid into a system operating at a higher pressure or located at a higher level by action of a vapor pressure produced from a portion of said liquid to be delivered, said pump comprising:

an outer closed reservoir provided with an unidirectional liquid inlet through which a liquid may flow by gravity, an unidirectional liquid outlet and a vapor exhaust valve adapted to balance the pressure between the unidirectional liquid inlet and the outer reservoir;

an inner, upwardly opened reservoir located inside the closed reservoir for receiving the liquid entering the closed reservoir through the liquid inlet, said inner reservoir being in liquid communication with the liquid outlet;

means for producing vapor inside the outer reservoir at a pressure sufficient to force out the liquid contained in said inner reservoir through the liquid outlet, said vapor producing means comprising an evaporation chamber in vapor communication with said closed reservoir, said



evaporation chamber being defined between the walls of said inner and outer reservoirs;

control means for operating said vapor producing means only when the liquid fed by the liquid inlet has reached a predetermined level into the inner reservoir;

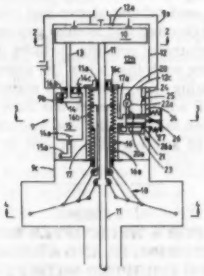
means responsive to said control means for sampling a portion of the liquid contained in the inner reservoir when said liquid in said inner reservoir has reached the predetermined level, and for supplying said sampled liquid into said evaporation chamber; and

heating means for evaporating said sampled liquid supplied to the evaporation chamber to produce the vapor pressure required to force the liquid out of the reservoir.

4,556,369
BELLOWS SEAL

Anton Braun, 6421 Warren Ave. S., Minneapolis, Minn. 55435

Filed Aug. 13, 1982, Ser. No. 407,816
The portion of the term of this patent subsequent to Jan. 3, 2001, has been disclaimed.
Int. Cl.⁴ F04B *39/04*
U.S. Cl. 417—437 18 Claims



1. Control apparatus for a bellows seal on a reciprocable shaft comprising means for substantially balancing gas pressures on the inside and the outside surfaces of the bellows seal, means for dividing convolutions of the bellows seal into a plurality of sections of unequal numbers of convolutions which sections decrease in number of convolutions sequentially from a fixed end of the bellows seal to a movable end thereof, and

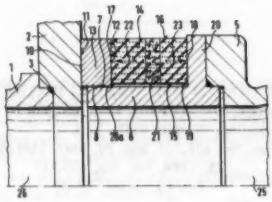
movable driving means extending between said shaft and said movable end and between said shaft and the means dividing the convolution sections to concurrently actuate said movable driving means when said shaft is moved so as to elongate or shorten the length of each section an amount substantially proportional to the number of convolutions in each section.

4,556,370

TWIN CYLINDER PUMPS, MORE SPECIALLY FOR CONCRETE

Friedrich Schwing, Herne, Fed. Rep. of Germany, assignor to Friedrich Wilh. Schwing GmbH, Herne, Fed. Rep. of Germany

Filed Nov. 7, 1983, Ser. No. 548,987
Claims priority, application European Pat. Off., Dec. 24, 1982, 82111988.0
Int. Cl.⁴ F04B *7/00, 15/02*
U.S. Cl. 417—517 **8 Claims**



1. A pump for viscous materials said pump having cylinder means and valve means, a cutting ring seated against said cylinder means and effecting a seal therewith, tubular means between said cylinder means and said valve means and extending into said cutting ring for guiding said cutting ring for movement axially thereof, an annular spring of rubber-like material surrounding said tubular means and having one end seated against a face of said cutting ring opposite from said cylinder, said valve means having an annular surface engaging the opposite end of said spring, the valve means being spaced from the cylinder means, an annular gap between said spring and said tubular means; passage means for transmitting hydrostatic pressure from within said cylinder and valve means to said annular gap; constraining means for fixed radial dimension engaging said spring and extending a substantial portion of its length for liminting said spring to axial deflection against said cutting ring and valve means under increased hydrostatic pressure within said annular gap.

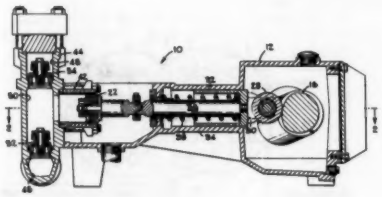
4,556,371

CONSTANT FLOW POSITIVE DISPLACEMENT PUMP

Steven W. Post, Jonesboro, Ark., assignor to FMC Corporation, Chicago, Ill.

Filed Jul. 18, 1983, Ser. No. 514,417
Int. Cl.⁴ F04B *11/00*
U.S. Cl. 417—539 **7 Claims**

1. A reciprocating power pump capable of pumping a non-lubricating fluid comprising:
a housing having a drive shaft rotably mounted therein;
a plurality of cylinders, numbering no less than three and no more than four, each having a pumping chamber, in said housing;
an intake and output manifolds common to all cylinders connected to said housing adjacent said pumping chambers;
an intake check valve for each cylinder permitting flow only from said intake manifold to the associated pumping chamber;
an output check valve for each cylinder permitting flow only from the associated pumping chamber to said output manifold;
a plurality of external cams, equal to the number of cylinders, on said drive shaft;
a roller follower engaging each cam;
a piston connected to each follower and reciprocable within the associated cylinder;



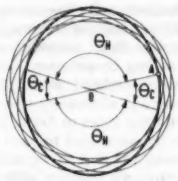
a seal carried by each piston and sealingly engaging the associated cylinder;
said cams having identical profiles angularly spaced relative to each other; and
said cams causing said pistons to reciprocate such that the sum of the velocity vectors of all pistons in equal to zero.

4,556,372

POSITIVE DISPLACEMENT MACHINE HAVING IMPROVED DISPLACEMENT CURVE

André Leroy, Mons, and Jean M. Flamme, Beloeil, both of Belgium, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed May 29, 1984, Ser. No. 615,473
Claims priority, application France, Jun. 16, 1983, 83 10192
Int. Cl.⁴ F04C *18/00*
U.S. Cl. 418—1 **5 Claims**



1. A positive displacement machine having a shaft, a slotted rotor fixed on the shaft, a tubular stator formed with a cylindrical inner stator surface surrounding the slotted rotor, and sealing elements sliding in the slots of the rotor to engage the stator surface and to delimit therewith a plurality of working chambers, said stator surface having a contour line the order of symmetry of which is an integer number s_S, this contour line being composed of s_S lobes belonging to a single shortened hypertrochoid with a core, the order of symmetry of which is a rational number S_H, and of s_S sealing zones belonging to the contour line of the core of this hypertrochoid, each lobe having a center point angle θ_H and each sealing zone having a center point angle θ_c, θ_H being related to θ_c and s_S by the expression:

$$\theta_H=(2\pi/s_S)-\theta_c$$

and

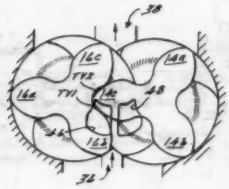
$$S_H/s_S=\theta_H+\theta_c/\theta_H.$$

4,556,373

SUPERCHARGER CARRYBACK PULSATION DAMPING MEANS

Raymond A. Soeters, Jr., Farmington Hill, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Sep. 4, 1984, Ser. No. 647,073
Int. Cl.[4] F04C *18/16, 18/18, 29/00*
U.S. Cl. 418—75 **11 Claims**



1. In a rotary blower of the backflow type including a housing defining first and second parallel, transversely overlapping cylindrical chambers having cylindrical and end wall surfaces; first and second meshed lobed rotors respectively disposed in the first and second chambers for transferring volumes of compressible low-pressure inlet port fluid via spaces between adjacent unmeshed lobes of each rotor to high-pressure outlet port fluid, the rotors and lobes having end surfaces and top lands sealing cooperating with the wall surfaces, and the meashing lobes sealing cooperating with each other; alternately formed first volumes defined by spaces between the meshing lobes each time a lobe top land of one rotor meshes with a root portion between adjacent lobes of the other rotor, the first volumes being trapped volumes isolated from the ports by the sealing cooperation during a least a portion of each mesh of the lobes, and tbe trapped volumes containing outlet port fluid and decreasing in size from a maximum to a minimum; the improvement comprising:

first and second recessed openings formed in at least one end wall of the chambers and respectively associated with the alternately formed trapped volumes, the recessed openings sealed against direct communication with the outlet port via the sealing cooperation, said recessed openings defining a volume related in size to the size of each trapped volume and alternately operative in response to rotation of the rotor lobes to firstly accumulate a portion of the fluid in the associated trapped volumes as the volumes decrease in size and to secondly communicate the fluid from the trapped volumes with the inlet port; and

said lobe end surfaces alternately cover and seal the recessed opening prior to formation of each associated trapped volume.

4,556,374

PURGING DEVICE FOR A FILLER CARRIER

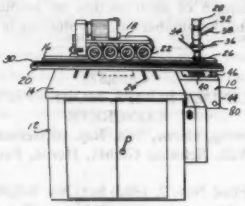
Walter G. LeTarte, 2040 Emerson Rd., Goodells, Mich. 48027

Filed Oct. 1, 1984, Ser. No. 656,480
Int. Cl.[4] B29C *5/00*; B29D *7/02, 31/00*
U.S. Cl. 425—114 **3 Claims**

1. In a filler carrier of the type for moving a metal extrusion in a generally horizontal plane beneath a dispensing nozzle for the dispensation of a liquid plastic material into a cavity formed in the metal extrusion so as to form a thermal barrier and wherein the nozzle is positioned above a fluid purging device over which the metal extrusion is horizontally displaced, the improvement comprising:

a movable purging device, said purging device comprising a movable conduit having an upper and lower opening;

support means for supporting said conduit for movement between a first lowered position wherein said upper opening is below a predetermined position which will permit horizontal displacement of said extrusion thereby and a second raised position wherein said conduit is elevated to receive said nozzle within said upper opening whereby fluid ejected from said nozzle is received into said conduit and exhausted from said lower opening; and



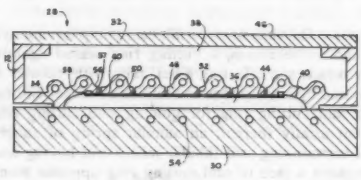
means operable upon actuation for moving said conduit between said first and second positions.

4,556,375

APPARATUS FOR MAKING WATER SKIS

Kendal Hancock, Wichita Falls, Tex., assignor to Texas Recreation Corporation, Wichita Falls, Tex.

Division of Ser. No. 431,845, Sep. 30, 1982. This application Sep. 28, 1984, Ser. No. 655,617
Int. Cl.[4] B29C *27/30*
U.S. Cl. 425—127 **7 Claims**



1. Mold apparatus for use in a reaction injection molding process comprising:

a first mold body having a mold cavity extending into the mold body from a parting line with a second mold body, a vacuum chamber formed within the mold body between a base wall of the mold cavity and a base of the mold body, and a partition wall formed integrally with the mold body and and being disposed between the vacuum chamber and the mold cavity, one of the surfaces of the partition wall forming the base wall of the mold cavity, the base wall of the mold cavity being provided with a plurality of openings extending through the partition wall providing communication between the vacuum chamber and the mold cavity,

said second mold body separable from the first mold body at the parting line,

a gasket positioned in an annular recess extending along the periphery of the base wall of the mold cavity and surrounding the plurality of openings,

means to provide a vacuum within said vacuum chamber in order to sealingly hold a sheet of semi-rigid material against the gasket and base wall of the mold cavity by said vacuum provided in the vacuum chamber acting through said plurality of openings upon said sheet of material, means for injecting foam producing materials into said mold cavity whereby said foam-producing materials injected into the mold cavity generate internal pressure within the mold cavity to further urge the sheet material against the gasket and base wall, and whereby after injection the sheet becomes a part of the finished product.

4,556,376
EXTRUDER HEAD FOR PRODUCING FLAT COHESIVE PROFILED WEBS FROM RESILIENT MIXTURES OF DIFFERING COMPOSITION

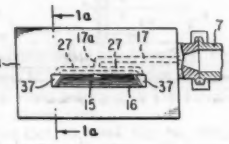
Willi Sievers; Hartwig Schlüter, both of Korbach, and Gerhard de Vries, Garbsen, all of Fed. Rep. of Germany, assignors to Continental Gummi-Werke Aktiengesellschaft, Hannover, Fed. Rep. of Germany

Filed Jun. 28, 1984, Ser. No. 625,598

Claims priority, application Fed. Rep. of Germany, Jul. 11, 1983, 3325017

Int. Cl.⁴ B29F *3/04*

U.S. Cl. 425—133.5 **4 Claims**



1. An extruder head to which three extruders are connected as a prerequisite for desired flowing together and satisfactory fusing of material mixtures controlled for producing a flat, cohesive profiled strip from resilient material mixtures having different compositions, said strip having a two-ply central portion, and two edge portions which are similar to one another; said extruder head comprising:

a first extruder;

a second extruder which is associated with said first extruder at an acute angle thereto;

an extrusion nozzle;

a preform die member which includes two flow channels disposed one above the other and respectively connected to one of said first and second extruders and to said nozzle so that material can be fed from said first and second extruders, via said flow channels, to said extrusion nozzle for said central portion of said profiled strip; and

also a third extruder connected to said preform die member, which further includes, starting from the point of connection of said third extruder thereto, a single connecting channel which leads to that portion of said preform die member in which said flow channels are disposed one above the other; in this last-mentioned portion of said preform die member, said connecting channel being split into two branch channels which span said flow channels, are essentially of the same length, and respectively end in an edge channel, both of which are connected to said extrusion nozzle so that material can be fed from said third extruder, via said single connecting channel, said branch channels, and said edge channels of said preform die member, to said extrusion nozzle for said edge portions of said profiled strip.

4,556,377
SELF-CENTERING ARRANGEMENT FOR COACTING FORMING TOOLS

Paul P. Brown, Orangeville, Canada, assignor to Husky Injection Molding Systems Ltd., Bolton, Canada

Filed Feb. 24, 1984, Ser. No. 583,132

Int. Cl.⁴ B23B *7/06*

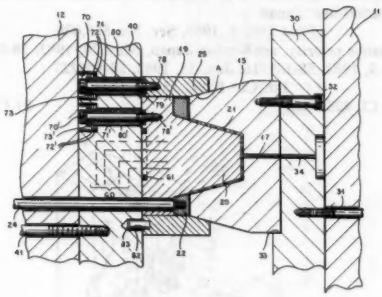
U.S. Cl. 425—138 **17 Claims**

1. In a workpiece-forming machine provided with two relatively movable platens, a first forming tool on one of said platens, a second forming tool on the other of said platens, said forming tools being mutually complementary to define a cavity between them in a closure position, and locking means on said one of said platens closely adjoining said first forming tool to form therewith a centering assembly insuring alingment of said forming tools with each other in said closure position in which a beveled centering surface of said locking means engages a complementarily beveled centering surface of said second forming tool,

the combination therewith of:

a backing plate fixedly mounted on said one of said platens for supporting said assembly; and

fastening means securing said assembly to said backing plate



with limited lateral shiftability relative thereto, said fastening means comprising a plurality of bolts each passing with clearance through a respective bore in said backing plate and engaging said assembly with a tight fit, said bolts projecting from a surface of said backing plate remote from said assembly and having heads separated from said surface by resilient means tending to draw said assembly onto said backing plate.

4,556,378
APPARATUS FOR EMBOSSING HIGH RESOLUTION RELIEF PATTERNS

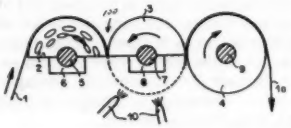
Alex Nyfeler, Baar; Peter Gehr, Cham; Martin Stalder, Baar, and Gregor Antes, Zürich, all of Switzerland, assignors to LGZ Landis & Gyr Zug AG, Zug, Switzerland

Filed Sep. 14, 1984, Ser. No. 650,900

Claims priority, application Switzerland, Sep. 19, 1983, 5072/83

Int. Cl.⁴ B29C *17/00;* **G02B** *5/00*

U.S. Cl. 425—143 **14 Claims**



1. An apparatus for embossing a high resolution relief pattern onto a thermoplastic information carrier, said apparatus comprising:

(a) first and second adjacent disks comprising a thermally and electrically insulating material and capable of being rotated about first and second adjacent axes in opposite senses, said first and second disks defining an embossing zone therebetween in which said disks are capable of exerting pressure on one another, said first disk being adapted to transport port said thermoplastic information carrier to said embossing zone,

(b) a metallic preheating band mounted under tension on said first disk for preheating said information carrier; and

(c) a band-shaped embossing mold, said band-shaped embossing mold being mounted on said second disk; said first and second disks being adapted to rotate so that said information carrier and said embossing mold come into

contact with one another in said embossing zone, the pressure exerted by said disks on one another in said embossing zone being sufficient to cause said relief pattern to be embossed onto said information carrier.

4,556,379

SUSHI SHAPING APPARATUS

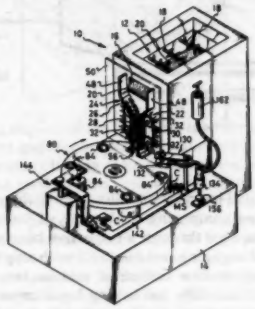
Toshimasa Ikishima, 1-1, Komatsu 2-chome, Tsuchiura-shi, Ibaraki-ken, Japan

Filed Dec. 5, 1983, Ser. No. 558,036

Claims priority, application Japan, May 20, 1983, 58-87625; Jun. 9, 1983, 58-101716; Jun. 13, 1983, 58-104227

Int. Cl.⁴ B29C *15/00, 17/10*

U.S. Cl. 425—163 **31 Claims**



1. A food shaping apparatus comprising:

a hopper adapted to be charged with a food material and having a delivery means provided therein which acts to carry said food material to an outlet of said hopper;

a transfer mechanism for downwardly transferring said food material discharged from said outlet of said hopper, said transfer mechanism being arranged adjacent to said outlet of said hopper and including a pair of carrying means which are vertically arranged opposite to each other to define a path therebetween to forcedly transfer said food material through said path;

a dividing mechanism for dividing said food material to prepare food material blocks of a substantially fixed quantity, said dividing mechanism comprising a cutter having a pair of blades arranged in proximity to the lower end of said carrying means and a cutter actuating means for allowing said blades to abut against each other or contactingly cross each other right below the central portion of said path; and

a control mechanism for intermittently driving said transfer mechanism and alternately actuating said transfer mechanism and said dividing mechanism.

4,556,380

PRESS FOR ADJUSTING AND INSPECTING MOLDS

Shuji Abe; Tatsumi Abe, both of Ashikaga, and Fumimaro Sakamoto, Numazu, all of Japan, assignors to Abeseiki Co., Ltd., Ashikaga, Japan

Filed Dec. 21, 1984, Ser. No. 684,948

Claims priority, application Japan, Dec. 21, 1983, 58-239864

Int. Cl.⁴ B29F *1/00*; B29C *17/00*

U.S. Cl. 425—188 **15 Claims**

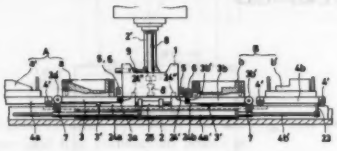
1. A press for adjusting and inspecting molds comprising:

a slide having a coupler provided on either side and driven for movement vertically;

a pair of bolsters provided on the opposite sides of the lowermost position of said slide and capable of being moved toward and away from said slide, each of said bolsters supporting one of a pair of halves of a mold and having couplers provided one on either end and capable of being detachably coupled to said respective opposite side couplers of said slide;

a pair of cars provided one on the outer side of each bolster and capable of being moved toward and away from said slide, each said car supporting the other one of the pair of halves of the corresponding mold;

a bolster inverter linkable to a bolster suspended from said slide with one of said couplers thereof coupled to a corresponding side coupler of said slide for swinging said bolster about said coupled coupler thereof; and



an inverter orientation controller coupled to said bolster inverter for tilting said bolster inverter by a given angle in a given direction;

whereby the bolster in a state suspended from said slide with its coupler at one end coupled to the corresponding side coupler of the slide can be caused by said bolster inverter to swing for coupling its coupler at the other end to the other coupler of the slide in an inverted state together with the mold held supported by it.

4,556,381

PRESS FOR PRODUCING PELLETS FROM BULK MATERIAL

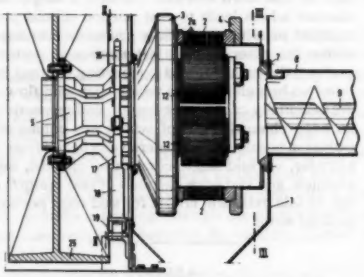
Ulrich Walter, Alterweg 17, D-4020 Mettmann 2, Fed. Rep. of Germany

Filed Apr. 6, 1984, Ser. No. 597,449

Claims priority, application Fed. Rep. of Germany, Apr. 9, 1983, 3312785

Int. Cl.⁴ B28B *3/12*

U.S. Cl. 425—331 **2 Claims**



1. A press for producing pellets from bulk material comprising, in combination:

an annular die formed with a plurality of radial press channels;

a holder positioned within said die;

a plurality of rollers mounted on said holder and juxtaposed with an inner surface of said die for rolling engagement with a bulk material introduced into the interior of said die for pressing said bulk material into said channels;

a shaft connected with said die for rotating said die relative to said holder, thereby displacing the inner periphery of said die relative to said holder and said rollers about a common axis of said shaft, said die and said holder;

means for connecting said shaft with a motor for rotating said shaft and said die;

a wheel affixed to said shaft and provided along its circumference with an array of projections;

a hydraulic ram pivotally mounted so that an actuating end of said ram can successively engage behind said projections to step said wheel angularly upon reciprocation of said ram, said ram being oriented so that force applied thereby to said wheel to step said wheel is effective tangentially with respect to the circumference of said wheel; and

spring means applying a biasing force to said ram in a plane of said ram and said wheel for biasing said ram against said wheel.

4,556,382

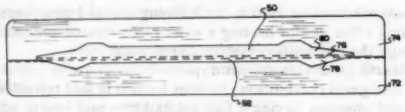
DIE ASSEMBLY FOR TIRE TREAD EXTRUDATE

John F. Nadeau, Jr., Mogadore, and Alexander J. Varvaro, Akron, both of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Oct. 11, 1984, Ser. No. 659,801

Int. Cl.⁴ B29F *3/10*

U.S. Cl. 425—462 **8 Claims**



1. A die assembly for producing an extrudate of layered composition, comprising:

a preform having at least two passages therein, said passages extending to separate and distinct vertically spaced openings on a face of said preform, said openings separated by a partition; and

a separate die plate maintained in operative communication with each said opening, a first of said die plates communicating with an upper opening and controlling a top geometric configuration of a top layer of the extrudate, and a second of said die plates communicating with a lower opening and controlling a bottom geometric configuration of a bottom layer of the extrudate, said pair of die plates defining a single aperature encompassing portions of each of said pair of openings and a portion of said partition.

4,556,383

RESONANT BURNER AND STARTING MECHANISM THEREFOR

Karl-Heinz Stahl, Zum Felchen 20, D-7770 Überlingen/Nussdorf, Fed. Rep. of Germany

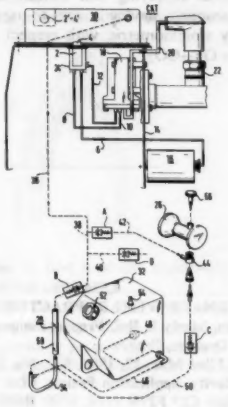
Continuation-in-part of Ser. No. 190,045, Sep. 23, 1980, abandoned. This application Nov. 16, 1983, Ser. No. 552,297

Claims priority, application Fed. Rep. of Germany, Sep. 26, 1979, 2938958

Int. Cl.⁴ F23C *11/04*

U.S. Cl. 431—1 **25 Claims**

1. A mechanism for starting a resonant burner having an ignition voltage generator and a compressed air pump which are to be started by temporarily connecting a manually activating switch with a battery, characterized in a first line, a carburetor having a nozzle, a first one-way valve, a second line, a U-shaped reservoir line, a third line, a fourth line, a fuel tank, a second one-way valve, a third one-way valve, a transparent upper section in the reservoir line, the first line leading from the compressed air pump to the nozzle in the carburetor, the first line having therein the first one-way valve which opens in direction toward the nozzle, the second line branching from the first line and leading by means of the U-shaped reservoir line and the third line to a fuel tank, said reservoir line being connected with the fourth line to the nozzle of the carburetor, the second line before the reservoir line having the second one-way valve opening towards the reservoir line, the fourth line having therein the third one-way valve opening toward



the reservoir line, and the reservoir line having a transparent upper section which communicates with the fuel tank by means of the third line and can fill with fuel to the level of the fuel in the fuel tank.

4,556,384

BURNER FOR PULVERIZED COAL

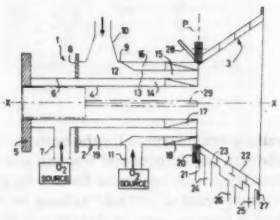
Serge Laurenceau, Versailles; Luc Moufflet, Vanves, and Bernerd Genies, Orsay, all of France, assignors to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude, Paris, France

Filed Oct. 17, 1983, Ser. No. 542,344

Claims priority, application France, Oct. 22, 1982, 82 17677

Int. Cl.⁴ F23D *11/36*

U.S. Cl. 431—160 **9 Claims**



1. A burner assembly for pulverized coal having a self-maintained combustion, comprising: a first source of a mixture of air and coal; a second source of substantially pure oxygen; a burner body comprising a free supply passageway for supplying said mixture of air and coal, means connecting said free passageway to said first source, a first supply passageway for supplying substantially pure oxygen concentrically surrounding the free passageway, supply means for supplying substantially pure oxygen radially inwardly with respect to said first supply passageway, means connecting said first supply passageway and said supply means to said second source, said free and first supply passageways having respective downstream discharge ends at which ends they open onto a common transverse plane, said first supply passageway being provided with a device for rotating the gas conveyed by said first supply passageway; and a divergent cowl provided with cooling

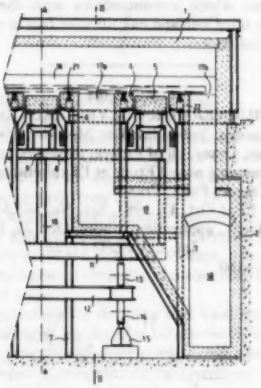
means and extending from said plane, said cowl having upstream fastening means for removably securing said cowl to said burner body and downstream fastening means for the removable mounting of the burner assembly, said first and second sources supplying said mixture and said oxygen in respective amounts having a coal-to-oxygen ratio which is substantially stoichiometric with respect to the combustion reaction $C+O_2 \rightarrow CO_2$.

4,556,385

FURNACE WITH REFRACTORY BEAMS

Michel Denis, Marly le Roi, France, assignor to Stein Heurtey S.A., Ris Orangis, France

Filed Mar. 12, 1984, Ser. No. 588,860
Claims priority, application France, Mar. 11, 1983, 8304263
Int. Cl.[4] F27B *9/14, 9/00;* B65G *25/02*
U.S. Cl. 432—122 4 Claims



1. In a walking-beam furnace for the heating of metal bodies advanced through said furnace and wherein at least two longitudinally extending walking beams flank a longitudinally extending stationary beam so that said walking beams alternately lift, metal bodies from an upper surface of said stationary beam and deposit said bodies on said surface in advancing said bodies along said beams, the improvement wherein in combination:

said stationary beam has a width greater than that of said walking beams;

said stationary beam is formed with a plurality of generally rectangular recesses opening along said surface and elongated in the longitudinal direction of said stationary beam, said recesses being flanked by portions of said stationary beam of smaller width than the widths of said recesses;

said stationary beam is formed with ducts communicating with said recesses below said surface for the delivery of hot gas to said recesses whereby said hot gas passes upwardly to contact the underside of metal bodies supported by stationary beam; and

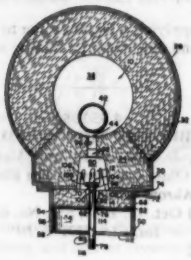
each recess has a bottom converging toward a respective one of said ducts whereby radiation from said recesses heats the undersides of said bodies.

4,556,386

COMBUSTION FURNACE AND BURNER

James G. McElroy, 115 Mesa Ct., Conroe, Tex. 77302

Continuation of Ser. No. 336,844, Jan. 4, 1982, Pat. No. 4,410,308. This application Oct. 12, 1983, Ser. No. 541,270
The portion of the term of this patent subsequent to Oct. 18, 2000, has been disclaimed.
Int. Cl.[4] F27B *9/00, 9/28;* C21D *9/54*
U.S. Cl. 432—149 2 Claims



1. A combustion system for burning air and gas thereby creating a flue gas for heating a work piece rotated and passed through the combustion system, comprising:

a hearth lined with refractory;

an elongated combustion chamber formed in said refractory, said chamber having a flue gas exit into said hearth adjacent to which the work piece passes;

an air manifold for receiving the air and mounted on said hearth with an insulator disposed therebetween;

at least one gas manifold for receiving the gas;

at least one aperture extending from said air manifold through said insulator and communicating with said combustion chamber, said gas manifold extending through said aperture to form an annular chamber for the passage of air from said air manifold to said combustion chamber;

said gas manifold having aspirating means for combining the gas from said gas manifold with the air flowing through said annular chamber from said air manifold to create an air/gas mixture; and

baffle means on said gas manifold for restricting flow of the air/gas mixture, said aspirating means being juxtaposed to said baffle means whereby the combustion of said air/gas mixture in said combustion chamber forms the flue gas which increases in velocity as the flue flows through said combustion chamber and exits onto the work piece to heat the work piece by forced convection.

4,556,387

DENTAL ARTICULATOR

Robert L. Lee, 22937 Grand Terrace Rd., Colton, Calif. 92324

Filed May 17, 1984, Ser. No. 611,342
Int. Cl.[4] A61C *11/00*
U.S. Cl. 433—58 12 Claims

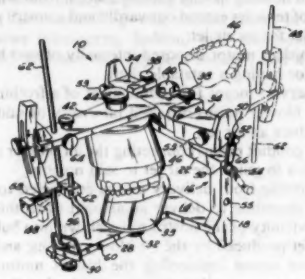
1. A dental articulator, comprising:

a lower frame having a pair of condyles thereon defining a hinge axis;

an upper frame carrying a pair of guides for slidably and pivotally receiving said condyles to permit the relative positions of said upper and lower frames to simulate movements of the human jaw;

retainers laterally outboard of said condyles on opposite sides of said articulator connecting said upper frame to said lower frame, said retainers urging said guides into contact with said condyles while permitting the frames to be moved to simulate jaw movements, wherein said guides separate from said condyles when said upper frame is pivoted toward a fully open position, and said retainers including means functioning as a hinge on which said

upper frame can pivot beyond the point where the condyles separate from the guides wherein said retainers



intersect said hinge axis when said upper and lower frames are in centric relationship.

4,556,388

DENTAL ATTACHMENT FOR FIXING DENTAL PROSTHESES

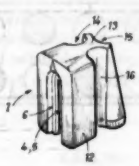
Helmut Hader, Les Allées 25, CH - 2300 La Chaux-De-Fonds, Switzerland

Filed Mar. 3, 1983, Ser. No. 471,675

Claims priority, application Switzerland, Mar. 31, 1982, 1976/82

Int. Cl.⁴ A61C *13/22*

U.S. Cl. 433—181 **10 Claims**



1. A dental attachment for fixing dental prosthesis to healthy teeth, comprising a male portion which can be rigidly fixed to a healthy tooth and a female portion which is rigidly fixed to the dental prostheses, the male portion comprising two independent pins which are intended to be secured by one of their ends in a healthy tooth and which have at their other end a spherical head, and said male portion also comprising a coupling member having a cavity or opening which opens at a lower face and also by way of an aperture in its lateral face, the assembly being so arranged that the spherical coupling members of the pins may be housed and sealed in the cavity or opening, the pins extending from the connecting member through said aperture.

4,556,389

METHOD AND COMPOSITIONS FOR BONDING METALS AND CERAMICS WITH WHICH TO MAKE PROSTHETIC TEETH

Masato Ueno; Masayoshi Sato; Mitsuyuki Tasaka, and Tatsuro Naito, all of Hiroshima, Japan, assignors to Four Brain Company Ltd., Hiroshima and Kyoto Ceramic Company Ltd., Kyoto, both of, Japan

Filed Dec. 31, 1981, Ser. No. 336,423

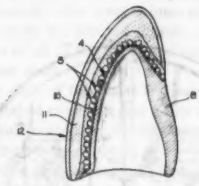
Int. Cl.⁴ A61C *5/08*

U.S. Cl. 433—206 **9 Claims**

1. A method of firmly bonding an opaque porcelain to a metal crown for prosthetic teeth comprising the steps of:

plating the metal crown with a plating solution containing metal ions and fine ceramic particles dispersed therein to form a composite layer on the metal crown, said composite layer comprising a metal layer on the surface of the metal crown having plurality of fine ceramic particles embedded in the metal layer and partially projecting above the metal layer;

applying the opaque porcelain to the composite layer; and



firing the porcelain to fuse it to the composite layer and thereby to the metal crown.

9. A prosthetic tooth consisting of a metal crown, a metal plating layer having a plurality of fine ceramic particles embedded therein and partially projecting therefrom formed on the metal crown and an opaque porcelain layer bonded to the metal plating layer.

4,556,390

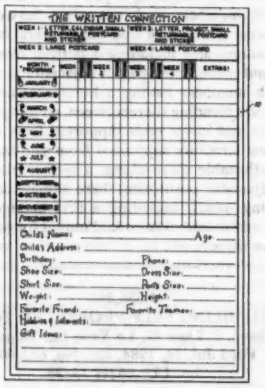
ADULT/CHILD COMMUNICATION KIT

Melanie H. Rahn, and Jane E. Braun, both of Chandler, Ariz., assignors to Dorothy Laporte, Phoenix, Ariz., a part interest

Filed Jun. 25, 1984, Ser. No. 624,472

Int. Cl.⁴ G09B *29/00*; B42D *15/00*

U.S. Cl. 434—433 **23 Claims**



1. A communication kit for organizing and encouraging postal communications between an adult and a child, said communication kit including a plurality of sets of stationery each tailored to a particular month and comprising:

a first plurality of items of stationery to be sent by said adult to said child at a first time of said particular month;

at least a first item of stationery to be sent by said adult to said child at a second later time of said particular month;

a second plurality of items of stationery to be sent by said adult to said child at a third still later time of said particular month; and

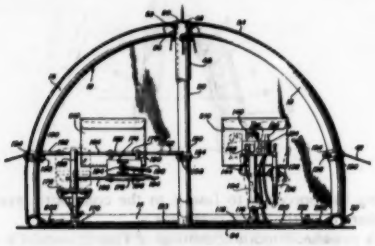
at least a second item of stationery to be sent by said adult to said child at a fourth still later time of said month.

4,556,391

INFLATABLE SHIP INTERIOR SIMULATING PLAY TENT

Georges M. Tardivel, Venice, Calif., and Monique M. Tardivel, P.O. Box 1174, 1601 Main St., Venice, Calif. 90291

Filed May 31, 1984, Ser. No. 615,802
Int. Cl.[4] A63H *17/00*; A45F *1/16*
U.S. Cl. 446—7 **12 Claims**



1. A play tent for children, said tent including an inflatable skeletal support frame, a downwardly opening canopy supported from said support frame, said canopy being at least light translucent and including access means for allowing ingress into and egress from the space enclosed within said canopy by children, an upright stanchion, mounting means mounting a lower portion of said stanchion within said space for limited universal angular displacement of said stanchion relative to said canopy, a ship's wheel journalled from said stanchion for rotation relative thereto about an axis generally normal to said stanchion, said skeletal support frame including a peripherally continuous lower base frame portion relative to which the lower marginal portion of said canopy is anchored, said base frame being generally quadrilateral in plan shape, said skeletal support frame also including a pair of crossed and interconnecting arch members each extending between diagonally opposite corner portions of said quadrilateral base frame portion, said canopy also including a bottom closing the lower portion of said space, a first pair of adjacent lower end portions of said arch members having a horizontal brace supported therefrom and extending therebetween, an upright seat support having upper and lower ends supported from said brace and bottom, a seat structure supported from said seat support and vertically adjustable there along, a mount mounted on said brace for adjustable positioning there along, and an elongated oar simulating handle including a first handgrip end and a second base end mounted from said mount for universal movement relative thereto.

4,556,392

BUBBLING SELF-PROPELLED TOY

Nelson S. Chang, 5, Lane 41, Lo Yang St., Taipei, Taiwan

Filed Jul. 24, 1984, Ser. No. 633,946
Int. Cl.[4] A63H *33/28*
U.S. Cl. 446—16 **4 Claims**

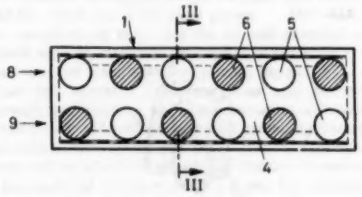
1. A self-driven bubbling toy octopus, comprising:
(a) a chassis;
(b) a hollow housing in the form of an octopus' head mounted on said chassis;
(c) said housing having a lower margin from which a plurality of tenacles extend outwardly and a nostril providing an outlet for an air jet;
(d) a bishaft motor disposed internally of said housing, said motor having a rotatable shaft;
(e) reservoir means for containment of a frothing liquid;
(f) air blower means disposed internally of said housing to produce an air jet;
(g) air conduit means connecting the air blower means to the nostril to guide the air jet to said nostril;
(h) movable froth delivery means connected to the chassis and operative to deliver an amount of frothing liquid to the vicinity of the nostril to be blown into bubbles by the air jet produced by the air blower means; and
(i) drive means connecting the bishaft motor to the air blower means and to the movable froth delivery means.

4,556,393

TOY BUILDING BLOCK WITH ELECTRICAL CONTACTS

Peter Bolli, Steinhausen, Switzerland, assignor to Interlego AG, Baar, Switzerland

Filed Feb. 8, 1984, Ser. No. 578,262
Claims priority, application Switzerland, Feb. 14, 1983, 815/83
Int. Cl.[4] A63H *33/04*
U.S. Cl. 446—91 **12 Claims**



1. A toy building block having on one face thereof at least two parallel rows of coupling pins thereon and on the opposite side of said face counter-coupling sockets for mechanical engagement with the coupling pins of another similar block, the coupling pins of said two rows being arranged in adjacent pairs, means for making electrical contact with select ones of the coupling pins of each row, the select pins of each row being longitudinally displaced from the select pins of the other row and said means includes portions adapted to make electrical contact with the selected pins of another similar block.

4,556,394

TOY BUILDING BLOCK SET

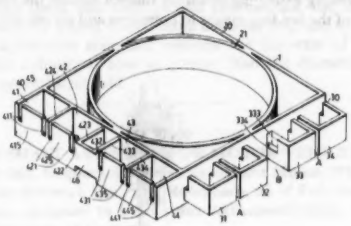
Chen-Tsung Chen, No. 16, Alley 2, La. 7, Feng-Tung Rd., Fengyuan City, Taichung Hsien, Taiwan

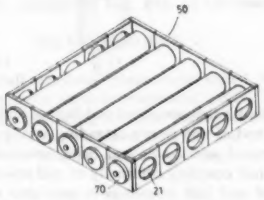
Filed Jul. 31, 1984, Ser. No. 636,374
Int. Cl.[4] A63H *33/08*
U.S. Cl. 446—124 **7 Claims**

1. A toy building block adapted to be assembled to develop a desired shape through connecting a number of like blocks, said block comprising:
a frame with straight sides, having a plurality of connecting elements projecting from at least one side thereof, each of said connecting elements having two side walls contiguous with said frame and a front wall extending between said side walls, said side walls having slots adjacent said frame;
a plurality of sockets provided on another side of said frame for receiving said connecting elements of a horizontally or vertically adjoining block, said sockets each having in-

versely complimentary slots which interlock with said connecting element side wall slots to secure said block with a horizontally adjoining block;

a means for interlocking with another block in a crossed, edgewise intersecting fashion, said interlocking means located between two adjacent sockets, and a space be-





tween two adjacent connecting elements being dimensioned to snap-fit around said interlocking means of a crossed, edge-wise intersecting adjoining block;

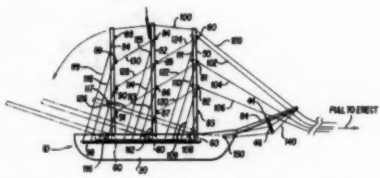
and an elongated inflatable member for passing through said frame to enable a plurality of blocks,to be connected and to increase the buoyancy of said blocks.

4,556,395

COLLAPSIBLE SHIP AND MODEL KIT

James D. Schultz, 19 N. Adelaide Ave., Highland Park, N.J. 08904

Filed Feb. 6, 1984, Ser. No. 577,214
Int. Cl.[4] A63H *23/02, 27/02*
U.S. Cl. 446—160 **7 Claims**



1. A ship assembly for mounting a bottle comprising

a hull having a generally horizontal deck;

a plurality of masts spaced apart along said deck from front to rear thereof;

a plurality of horizontal yards secured to each mast and spaced apart along each mast;

openings in said deck, each of which is shaped to complement the shape of the end of a mast and to receive the end of one of said masts and in which the end of the received mast is pivotably seated;

a plurality of non-elastic rigging lines secured at their ends to the outside of the hull and extending from one side of the hull across a mast where a yard is secured to the other side of the hull, there being one rigging line associated with each yard on each mast;

a plurality of non-elastic yard lines, each extending from the end of a yard on one mast to the end of a yard on the mast behind it;

a bowsprit; and

a plurality of non-elastic lines extending through openings in the bowsprit, with several lines secured to the first mast where yards are secured thereto and one line contacting the tops of all of the masts and secured to the tops of the sternmast mast;

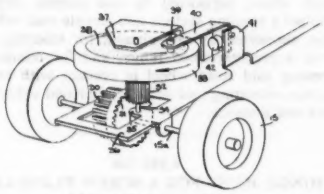
the lower ends of the masts and said openings in said deck being shaped to permit said masts to pivot toward the rear of the hull to collapse the ship assembly and to permit it to be inserted into a bottle, whereupon the said last-mentioned lines, which extend through the bowsprit, may be pulled forwardly to rotate the masts forwardly to raise them and to place the ship assembly in display position.

4,556,396

STUNT-PERFORMING TOY VEHICLE

Melvin R. Kennedy, New York, N.Y.; Dietmar Nagel, Chester, N.J., and Abraham Arad, Westport, Conn., assignors to Buddy L Corporation, New York, N.Y.

Division of Ser. No. 478,237, Mar. 24, 1983, Pat. No. 4,479,326.
This application Aug. 14, 1984, Ser. No. 640,752
Int. Cl.[4] A63H *17/04*
U.S. Cl. 446—23 **2 Claims**



1. A toy automobile comprising:

A. a chassis having rotatably mounted thereon front and rear wheel axles to which wheels are attached;

B. a hollow body supported on the chassis to simulate the appearance of an automobile, said body being molded of plastic material and having translucent windows;

C. an energy-storing flywheel motor mounted for rotation on the chassis within the body on a flywheel axle which is normal to the rear wheel axle and is supported at either end by bearings secured to the chassis, said flywheel motor having a layer of abrasive material on its upper face;

D. gear means operatively coupling the rear wheel axle to the flywheel axle whereby rotation of the rear wheel axle sets the flywheel motor spinning to store energy for propelling the vehicle in the forward direction, the relationship of the flywheel motor to the structure of the vehicle being such as to cause the vehicle to behave as a gyro exhibiting precessional motion which, in combination with the forward motion of the vehicle, makes possible rear wheelies, spin outs and other stunts; and

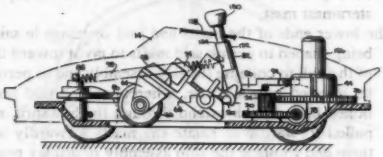
E. a flint engaging the abrasive layer on the flywheel whereby as the vehicle is propelled in the forward direction, sparks are generated which are visible through the windows of the body to simulate motor activity.

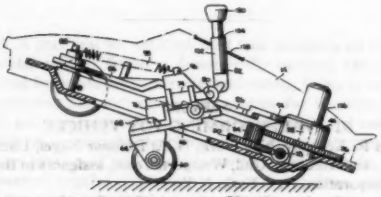
4,556,397

TOY VEHICLE

Avi Arad, #6 Minute Man Hill, Westport, Conn. 06880; Melvin R. Kennedy, #2 Fifth Ave., New York, N.Y. 10011, and Dietmar Nagel, 147 South Rd., Chester, N.J. 07930

Filed Dec. 6, 1984, Ser. No. 678,673
Int. Cl.⁴ A63H *17/00*
U.S. Cl. 446—436 **16 Claims**





1. A toy vehicle, comprising:
a chassis;
a traveling wheel, rotatably mounted on said chassis, supporting said vehicle;
a stunt wheel, supported by said chassis, depressible to contact a running surface and elevate said vehicle; and
means, supported by said chassis, for selecting a distance from a predetermined range, and for continuously depressing said stunt wheel in contact with said running surface, elevating said vehicle, after said vehicle has traveled said distance.

4,556,398

HINGE JOINT FOR A SCREW PLANETARY HYDRAULIC DRILL

Dmitry F. Baldenko; Yury V. Vadetsky, both of Moscow; Vladimir B. Goldobin, Perm; Moisei T. Gusman, Moscow; Anatoly M. Kochnev; Samuil S. Nikomarov, both of Perm, and Valery I. Semenets, Moscow, all of U.S.S.R., assignors to Vsesojuzny Nauchnoissledovatelsky Institut Burovoi Tekhniki, Moscow, U.S.S.R.

PCT No. PCT/SU81/00042, § 371 Date Mar. 12, 1982, § 102(e) Date Mar. 12, 1982, PCT Pub. No. WO82/03886, PCT Pub. Date Nov. 11, 1982
Continuation of Ser. No. 359,656, Mar. 12, 1982, abandoned.
This PCT application Apr. 28, 1981, Ser. No. 631,519
Int. Cl.⁴ E21B *4/02*
U.S. Cl. 464—16 **5 Claims**

1. A universal hinge joint for a bottom-hole helical planetary hydraulic machine comprising a cylindrical casing having an inner gear ring formed on the inner wall thereof, a cover closing each end of said casing, two half couplings extending coaxially through each of said covers into said casing in opposition to each other, each half coupling having a hemispherical recess on its inner end and a gear on the outer surface thereof in meshing engagement with said inner gear ring, a ball disposed in the recesses between said half couplings, and a lubricant within said casing surrounding said inner gear ring, said outer gears and said ball, and a pair of seals for sealing each end of said casing respectively, each seal comprising an elastic cylindrical sleeve surrounding the corresponding half coupling and having a radially outwardly extending and axially thickened inner flange, and holding means formed of a material having a hardness substantially greater than that of the sleeve, said holding means comprising at least a first annular ring embracing the outer end surface of the flange and a second annular ring embracing the inner end surface of said flange, and said covers being secured at the respective outer end of said casing extending inwardly thereof against the first annular ring of the holding means to compress and secure said flange in

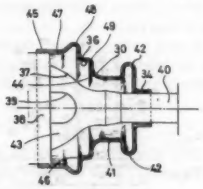
abuttment with the associated end face of said inner gear ring, the outer end of said sleeve extending axially outward of said casing beyond said cover and being secured to said corresponding half coupling externally of said cover, the outer end of each of said half couplings is provided with an annular groove having a diameter substantially equal to the inner diameter of said sleeve, said sleeve being secured by a detachable clamp fitting over said sleeve into said groove.

4,556,399

PROTECTIVE BELLOWS, PARTICULARLY FOR THE FRONT WHEEL DRIVE OF A MOTOR VEHICLE

Maurice Billet, Thouare, and Serge Lallement, La Chapelle sur Erdre, both of France, assignors to Compagnie des Produits Industriels de l'Ouest, Nantes, France

Filed Dec. 16, 1983, Ser. No. 562,077
Claims priority, application France, Dec. 16, 1982, 82 21118
Int. Cl.⁴ F16D *3/84*
U.S. Cl. 464—175 **9 Claims**



1. A protective bellows for a shaft having one end connected to a large diameter element via a connection permitting relative pivoting therebetween about two orthogonal axes, said bellows comprising an elastic annular member defining in order along the axis of said shaft towards said large diameter element:
a small diameter sleeve connected to said shaft;
a small diameter fold connected to said small diameter sleeve;
a first cylindrical zone connected to said small diameter fold and having a smaller diameter than said small diameter fold;
an intermediate diameter fold connected to said first cylindrical zone via a curvature;

a large diameter fold connected to said intermediate diameter fold wherein the walls of said large diameter fold form an angle of less than 90°; and

a second cylindrical zone connected between said large diameter fold and said large diameter element wherein walls of said intermediate fold form at least a right angle between them, said walls of said intermediate fold being respectively joined to said large diameter fold and to said first cylindrical zone and wherein the diameter of said second cylindrical zone is greater than the diameter of said intermediate fold.

4,556,400

DRIVE SHAFT ASSEMBLY FOR MOTOR VEHICLES

Werner Krüde, Siegburg-Kaldauen; Karl-Heinz Müller, Wissen, and Hans-Heinrich Welschof, Rodenbach, all of Fed. Rep. of Germany, assignors to Uni-Cardan Aktiengesellschaft, Siegburg, Fed. Rep. of Germany

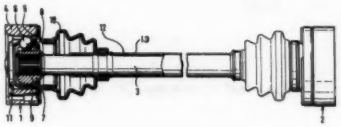
Continuation of Ser. No. 405,197, Aug. 4, 1982, abandoned. This application Oct. 22, 1984, Ser. No. 663,818

Claims priority, application Fed. Rep. of Germany, Aug. 5, 1981, 3130994

Int. Cl.⁴ F16D *3/84*

U.S. Cl. 464—181 **8 Claims**

1. A drive shaft assembly particularly suited for power transmission in a motor vehicle comprising a drive shaft, universal joint means including an inner joint member and an outer joint member connected to at least one end of said drive shaft, a sealing boot attached in sealing engagement between said outer joint member and said drive shaft for protectively sealing said universal joint means, and an elastomeric cover on the outer surface of said drive shaft, said elastomeric cover extending along the axial length of said drive shaft from the exterior of said sealing boot to within the region enclosed by said sealing boot on the interior thereof, wherein said universal joint means comprise a pair of universal joints attached at opposite ends of said drive shaft and wherein a sealing boot is attached in sealing engagement between each of said universal



joints and said drive shaft, said elastomeric cover extending along the entire length of said drive shaft between said sealing boots to within the interior of each of said sealing boots, said elastomeric cover further comprising means defining channels on the interior of said elastomeric cover between said elastomeric cover and said drive shaft, said channels operating to place the interiors of both said sealing boots in flow communication with each other to enable pressure equalization therebetween.

4,556,401

PROCESS FOR DYEING AMIDE-CONTAINING FIBRE MATERIALS

Robert Weitz, Cologne; Rütger Neeff, Leverkusen, and Herbert Hugl, Bergisch Gladbach, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Aug. 3, 1984, Ser. No. 637,453

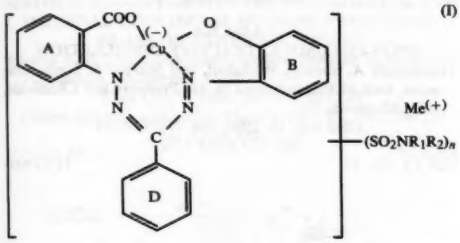
Claims priority, application Fed. Rep. of Germany, Aug. 12, 1983, 3329193

Int. Cl.[4] D06P *1/39, 3/24*

U.S. Cl. 8—641 2 Claims

1. In the process for the dyeing of natural and synthetic polyamide fibres with a dyeing agent, the improvement wherein said agent comprises a combination of

(a) a sulpho- and carboxyl-free non-reactive blue dyestuff of the formula



(I)

wherein

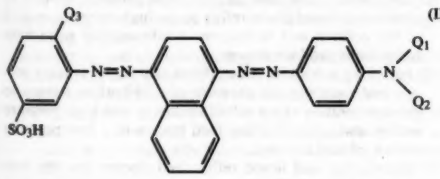
R_1 denotes hydrogen, optionally substituted alkyl, aralkyl, alkenyl, cycloalkyl or aryl,

R_2 denotes hydrogen or alkyl,

$Me^{(+)}$ denotes a cation and

n denotes 1 or 2, with the proviso that the $-SO_2NR_1R_2$ radical is bonded to ring A and/or B, while said rings A, B and D can be further substituted by Cl, Br, F, C_1–C_4-alkyl, C_1–C_4-alkoxy, CF_3 or NO_2; said alkyl radicals have 1–6 C atoms which can be further substituted by OH, $-OC_1$–C_4-alkyl or $-O-C_2H_4-O-C_1$–C_4-alkyl; said aralkyl radicals are benzyl or phenylethyl; said alkenyl radicals are allyl or butenyl; said aryl radicals are phenyl radicals which can be further substituted like rings A–D and said cycloalkyl radicals are cyclohexyl or methylcyclohexyl, and

(b) a red dyestuff of the formula

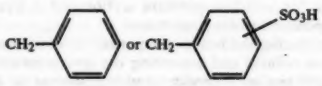


(IIa)

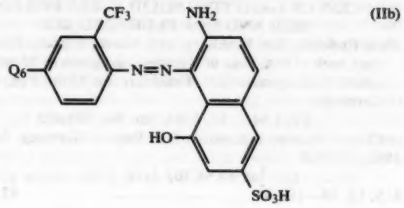
wherein

Q_1 denotes C_2H_5 or C_2H_4OH,

Q_2 denotes C_2H_5, C_2H_4OH,



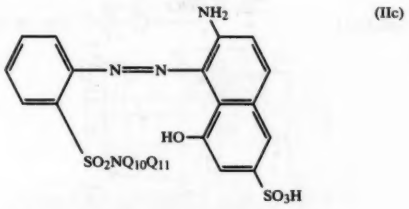
Q_3 denotes H, Cl or CH_3, or



(IIb)

Q_6=Cl or $NHCOQ_7$,

Q_7=C_1–C_4-alkyl, phenyl, cyclohexyl, NH—C_1–C_4-alkyl, NH-phenyl or NH-cyclohexyl or

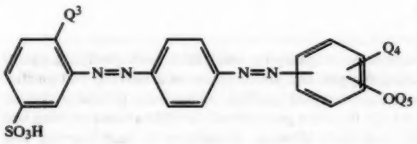


(IIc)

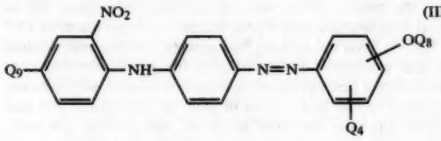
Q_{10}=H, C_1–C_{10}-alkyl, cyclohexyl or phenyl, and

Q_{11}=H or C_1–C_4-alkyl, and/or

(c) a yellow dyestuff of the formula



(IIIa)



(IIIb)

Q_8 = C_1–C_4—alkyl, $-SO_2-$ or

C_1–C_4—hydroxyalkyl, and

Q_9 = SO_3H, SO_2NHSO_2- or

SO_2NHSO_2—C_1–C_4—alkyl,

wherein

Q_4 denotes H or CH_3 and

Q_5 denotes C_1–C_4-alkyl (preferably CH_3 or C_2H_5) or C_2–C_4-hydroxyalkyl (preferably $CH_2CHOHC_2H_5$)

where $-OQ_5$ is in the ortho- or para-position relative to the azo linkage.

4,556,402

PROCESS OF GASIFYING SOLID FUELS IN A MOVING BED AND IN A FLUIDIZED BED

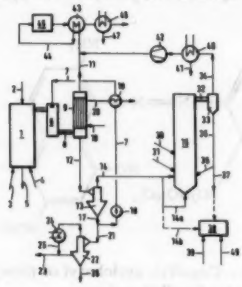
Paul Rudolph, Bad Homburg, and Martin Hirsch, Friedrichsdorf, both of Fed. Rep. of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Mar. 14, 1984, Ser. No. 589,602

Claims priority, application Fed. Rep. of Germany, Mar. 22, 1983, 3310220

Int. Cl.[4] C10J *3/16, 3/54*

U.S. Cl. 48—197 R 12 Claims



1. A process of gasifying solid fuels with gasifying agents containing oxygen and water vapor in a moving bed gasifier and in a fluidized bed gasifier, comprising gasifying coarse, grained solid fuels at a pressure of 5 to 150 bars in a moving bed gasifier, said fuels slowing descending in said moving bed gasifier, introducing the gasifying agents into said moving bed from below, withdrawing incombustible mineral constituents from the bottom of the moving bed gasifier as solid ash or liquid slag, withdrawing a product gas at temperatures of 250° to 700° C. from the moving bed gasifier, feeding said product gas into a scrubber-cooler wherein the gas is intensely contacted with a first stream of aqueous condensate, withdrawing a mixture of said first stream of aqueous condensate and said product gas from the scrubber-cooler, said product gas withdrawn from the scrubber-cooler having a temperature in the range of 140°–230° C., feeding said mixture into a waste-heat boiler wherein said mixture is cooled, separating a second stream of aqueous condensate from the product gas in said waste-heat boiler, said second stream of aqueous condensate having a temperature of 120° to 220° C., the pressure in said waste-heat boiler being the same as in said moving bed gasifier, pressure-relieving the second stream of aqueous condensate into a pressure relief vessel, the pressure in said vessel being at least 2 bars below the pressure in said waste-heat boiler, separately withdrawing a flashed-off vapor and a third stream of aqueous condensate from said vessel, recycling part of said thrid stream of aqueous condensate to said scrubber-cooler as said first stream, gasifying fine-grained solid fuels with oxygen and water vapor in a fluidized bed gasifier at a pressure which is lower than the pressure in said moving bed gasifier, withdrawing a product gas at a temperature of 800° to 1200° C. from said fluidized bed gasifier, supplying at least part of said flashed-off vapor to the fluidized bed gasifier at least at the rate at which water vapor is required for gasification in the fluidized bed gasifier.

4,556,403

DIAMOND ABRASIVE PRODUCTS

Eric A. Almond, 34 Weston Ave., West Molesey, Surrey, KT8 9RG, and Mark G. Gee, 20 Morland Close, Hampton, Teddington, Middlesex, both of England

Filed Jan. 31, 1984, Ser. No. 575,340

Claims priority, application United Kingdom, Feb. 8, 1983, 8303498

Int. Cl.[4] B24D *3/02*

U.S. Cl. 51—308 14 Claims

1. An abrasive body comprising a mass of diamond particles present in an amount of at least 70 percent by volume of the body and containing substantial diamond-to-diamond bonding to form a coherent skeletal mass and a second phase comprising up to 30 percent by volume of the body and dispersed through at least part of the skeletal mass, the second phase being a glass having a melting point in the range 800° to 1400° C.

4,556,404

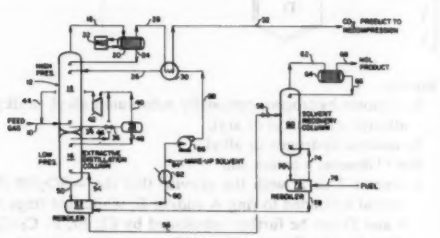
SPLIT-COLUMN EXTRACTIVE DISTILLATION

Thirthahalli A. Shenoy, Whitehall, and Martha S. Losin, Emmaus, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Sep. 19, 1984, Ser. No. 652,231

Int. Cl.[4] F25J *3/02*

U.S. Cl. 62—17 11 Claims



1. A method for the extractive distillation of a feed gas stream into several products comprising the steps of:

(a) introducing a feed gas containing multiple separable components into the high pressure section of a two pressure section extractive distillation column;

(b) contacting the feed gas with an extractive solvent to assist in the separation of the multiple components of the gas;

(c) cooling the overhead of said high pressure section to condense a liquid phase reflux to the high pressure section of the column and to recover a substantially pure light component product stream;

(d) removing a bottom stream from said high pressure section and reducing the pressure of said bottom stream to phase separate a vapor reboil stream to said high pressure section and a liquid reflux feed stream to a low pressure section of said column;

(e) introducing said liquid reflux feed stream into the low pressure section of said two pressure section extractive distillation column;

(f) removing a light component stream from the overhead of said low pressure section, repressurizing the same and introducing it into the high pressure section;

(g) reboiling said low pressure section to provide vapor reboil for said low pressure section and a liquid heavy component solvent stream; and

(h) introducing the heavy component solvent stream into a second column and separating the stream into the heavy components as a product and the solvent as a recycle extractive solvent to the two pressure section extractive distillation column.

10. An apparatus for the extractive distillation of a multiple component feed gas stream into a light component product and a heavy component product comprising:

(a) an extractive distillation column with a high pressure section and a low pressure section;

(b) a condenser for the high pressure section;

(c) a reboiler for the low pressure section;

(d) means for flashing and separating a bottom stream from said high pressure section to form a reboil stream for the high pressure section and a reflux stream for the low pressure section;

(e) a second column for separating extractive solvent from heavy component product, and

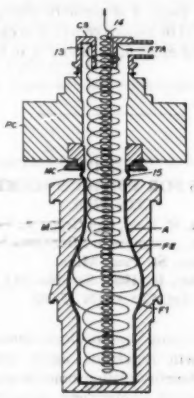
(f) means for circulating extractive solvent from said second column, through said reboiler in indirect heat exchange, and to said extractive distillation column.

4,556,405

METHOD AND APPARATUS FOR THE BLOWING AND INTERNAL COOLING OF HOLLOW ARTICLES OF GLASS OR OTHER MATERIALS

Alberto A. H. Luna, Guadalupe, Mexico, assignor to Vitro TEC Fideicomiso, Monterrey, Mexico

Filed Oct. 3, 1984, Ser. No. 657,230
Claims priority, application Mexico, Oct. 20, 1983, 199155
Int. Cl.[4] C03B 9/36
U.S. Cl. 65—82 **7 Claims**



1. A method of blowing and internally cooling hollow articles of thermoformable materials, comprising the steps of:

providing a continuous flow of blowing and cooling air under pressure;

converting said air flow into a gyratory axial flow of said air;

introducing said gyratory flow of air into one end of a blowing mold as the source of blowing air therefore;

permitting said gyratory flow of air to proceed through said mold in a first axial direction to an opposite end of said mold as a substantially laminate flow of said gyratory axial flow of said air;

reversing the axial direction of said flow of said gyratory flow of air at an opposite end of said mold; and,

exhausting said axially reversed gyratory flow of air from said mold from said one end of said mold in an axial direction opposite said first axial direction, and, as a gyratory flow of air co-axial with and confined within said gyratory flow of air in said first axial direction.

4. A blowing head for a machine used in the blow molding of hollow articles of thermoformable materials, said blowing head comprising;

a body providing an annular chamber defined by inner and outer walls and an annular end wall closing one axial end of said chamber, said inner wall defining an outlet passage extending through said body and co-axial with said annular chamber; and,

air inlet means positioned proximate said closed end of said annular chamber, and operative to inject a high-pressure flow of air tangentially into said chamber;

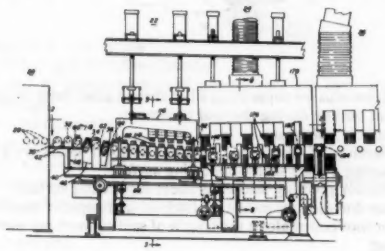
whereby said air injected into said chamber is converted into a gyratory cyclonic flow of air issuing from said open end of said chamber for use in said blow molding of said hollow articles, said gyratory flow exhausting from said hollow articles through said outlet passage and concentrically within said gyratory flow within said articles.

4,556,406

COMPOUND BEND ROLL FORMING

Lisa M. Kahle, Altoona, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Oct. 25, 1984, Ser. No. 664,666
Int. Cl.[4] C03B 13/16
U.S. Cl. 65—106 **14 Claims**



1. An apparatus for shaping heat softened glass sheets into a configuration having a longitudinal radius of curvature that varies in a direction transverse to the glass sheet, the apparatus including a roll forming station comprising:

a first traversely extending reference roll;

a first series of longitudinally spaced and transversely extending forming rolls adjacent and downstream from said first reference roll;

means to mount a first portion of said first series of forming rolls along a first continuous arcuate path defining a first longitudinal radius of curvature and a second portion of said first series of forming rolls along a second continuous arcuate path defining a second longitudinal radius of curvature, wherein said first and second longitudinal radii are selected such that said first series of forming rolls defines a curved path having a longitudinal radius of curvature that varies in a direction from said first portion to said second portion of said first series of forming rolls; and

means to position said reference roll such that a first portion of said reference roll is positioned along said first longitudinal radius and a second portion of said reference roll is positioned along said second longitudinal radius.

14. A method of shading a heat softened glass sheet to longitudinal radii of curvature that varies in a direction transverse to the glass sheet comprising:

mounting each of a series of longitudinally spaced and transversely extending forming rolls such that a first portion of each of said rolls is positioned along a first continuous arcuate path defining a first longitudinal radius of curvature and a second portion of each of said rolls is positioned along a second continuous arcuate path defining a second longitudinal radius of curvature, wherein said first and second longitudinal radii are selected such that said series of forming rolls defines a curved path having longitudinal radii of curvature that varies in a direction from said first portion to said second portion of said series of forming rolls; and

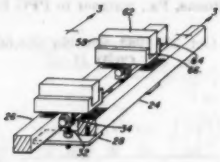
conveying said heat softened glass sheet over said series of rolls to shape said sheet along said curved path.

4,556,407

TEMPERING RING WITH PIVOTING GLASS SHEET SUPPORT MEMBER

Michael T. Fecik, Pittsburgh; Robert G. Frank, Franklin Township, Westmoreland County; John J. Ewing, Tarentum, and Andrew C. Siminerio, Pittsburgh, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Aug. 2, 1984, Ser. No. 637,102
Int. Cl.⁴ C03B *23/02*
U.S. Cl. 65—289 **17 Claims**



1. Apparatus for supporting a hot shaped glass sheet of given size and outline during thermal treatment:

a support rail means;

a plurality of discrete glass sheet support members each having a glass sheet supporting surface;

means for pivoting said glass sheet supporting surface;

means for slidably mounting each of said support members for movement along the length of said support rail means; and

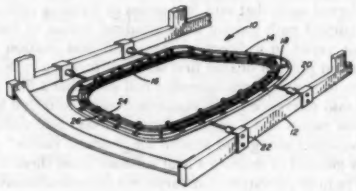
means for detachably securing each of said support members at desired locations, in spaced relation to one another, along said support rail means wherein said glass sheet supporting surfaces of said support members define a peripheral contour similar to that of said hot shaped glass sheets to be supported thereon.

4,556,408

DUAL RING SEGMENTED BLOCK TEMPERING RING

Michael T. Fecik, Pittsburgh; Robert G. Frank, Franklin Township, Venango County, and John J. Ewing, Tarentum, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Aug. 2, 1984, Ser. No. 637,103
Int. Cl.⁴ C03B *23/02*
U.S. Cl. 65—289 **18 Claims**



1. Apparatus for supporting a hot shaped glass sheet of given size and outline during thermal treatment:

a support rail means;

a plurality of discrete glass sheet support members each having a glass sheet supporting surface;

means for slidably mounting each of said support members for movement along the length of said support rail means; and

means for detachably securing each of said support members at desired locations, in spaced relation to one another, along said support rail means wherein said glass sheet supporting surfaces of said support members define a peripheral contour similar to that of said hot shaped glass sheets to be supported thereon.

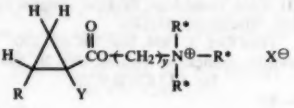
4,556,409

2-VINYL- AND 2-ETHYLCYCLOPROPANE MONOCARBOXYLATES AS PLANT GROWTH MODIFIERS

Richard G. Fayter, Jr., Fairfield, and Allen L. Hall, Amelia, both of Ohio, assignors to Emery Industries Inc., Cincinnati, Ohio

Division of Ser. No. 333,213, Dec. 21, 1981, Pat. No. 4,418,202. This application Sep. 6, 1983, Ser. No. 529,317
Int. Cl.⁴ A45C *13/10*; E05B *65/52*
U.S. Cl. 71—76 **4 Claims**

1. A method of modifying soybean growth comprising applying to said soybean plants an effective growth modifying amount of a compound of the formula



where R is ethyl or vinyl, Y is nitrile or phenyl, R* is methyl, ethyl, hydroxymethyl or hydroxyethyl, X is chloride, bromide, hydroxide, sulfate, or ethasulfate, and y is an integer from 2 to 4.

4,556,410

COMPOSITIONS FOR TOBACCO SUCKER GROWTH CONTROL

Patricia M. Ronning, St. Paul, and Gregg A. Vandesteeg, Roseville, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Mar. 10, 1981, Ser. No. 242,173
Int. Cl.⁴ A01N *25/30*
U.S. Cl. 71—78 **16 Claims**

1. Tobacco desuckering compositions, comprising:

(a) a plant growth regulation agent selected from 5-acetamido-2,4-dimethyl-trifluoromethanesufanilide, 6-hydroxy-3(2H)pyridazinone, and agriculturally acceptable salts thereof, and

(b) a surface-active agent, comprising at least one ethoxylated C_{12-18} unsaturated fatty acid, ethoxylated C_{12-18} unsaturated fatty amine, or ethoxylated C_{12-18} unsaturated fatty amide, said surface-active agent containing an average of about 2 to 40 oxyethylene radicals per molecule.

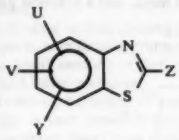
4,556,411

BENZOTHIAZOLE DERIVATIVES FOR PLANT GROWTH AND DEVELOPMENT MODIFICATION

Jonathan S. Baum, Pennington, and Tsong M. Chen, Princeton Junction, both of N.J., assignors to FMC Corporation, Philadelphia, Pa.

Filed Dec. 7, 1984, Ser. No. 679,518
Int. Cl.⁴ A01N *43/78*; C07D *417/04, 277/66*
U.S. Cl. 71—90 **27 Claims**

17. A method of modifying the growth and development of plants which comprises applying to the locus where such modification is desired a plant growth and development modifying effective amount of at least one 2-(2-oxycarbonylcyclic)-benzothiazole of the formula



wherein

U is selected from -hydrogen, -halogen, -lower alkyl, -lower haloalkyl, -lower alkoxy, -phenyl, and -phenoxy optionally carrying -halogen and -lower haloalkyl substituents;

V is selected from -hydrogen and -halogen, or U and V taken together are —C_4H_4—joining adjacent ring positions;

Y is selected from -hydrogen and -lower alkoxy;

Z is selected from

(a) -phenyl optionally carrying 1 or 2 substituents independently selected from -halogen, -nitro, or two substituents taken together are —C_4H_4—joining adjacent ring positions; or

(b) a six-membered saturated or partially unsaturated carbocycle, optionally carrying a bicyclic —CH_2— bridge, and provided U is -hydrogen, -halogen or -phenyl and V and Y are -hydrogen; or

(c) a five or six-membered aromatic heterocycle containing 1 or 2 nitrogen atoms, as the only hetero atoms, provided U is -hydrogen, -halogen or -phenyl and V and Y are -hydrogen; and

Z also carries a 2-oxycarbonyl substituent of the formula

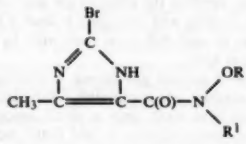
in which W is selected from -hydrogen, -lower alkyl, and an agriculturally acceptable cation.

4,556,412
HERBICIDAL HYDROXYAMIDES OF 2-BROMO-4-METHYLIMIDAZOLE-5-CARBOXYLIC ACID

Andrea Leone-Bay, Ridgefield, Conn., and Peter E. Timony, Valley Cottage, N.Y., assignors to Stauffer Chemical Company, Westport, Conn.

Filed Oct. 18, 1984, Ser. No. 662,007
Int. Cl.[4] A01N *43/50*; C07D *233/90*
U.S. Cl. 71—92 **12 Claims**

7. The method of controlling undesirable vegetation comprising applying to the area where control is desired an herbicidally effective amount of a compound having the structural formula



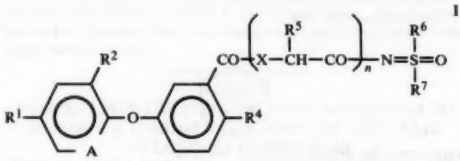
wherein R is hydrogen or C_1–C_6 alkyl, unsubstituted phenyl; unsubstituted benzyl; and R_1 is hydrogen or C_1–C_6 alkyl.

4,556,413
CERTAIN ARYLOXY-BENZOYL SULFOXIMINES HAVING HERBICIDAL ACTIVITY

Georg Frater, Greifensee; Milos Suchy, Pfaffhausen; Jean Wenger, Uster, and Paul Winternitz, Greifensee, all of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Oct. 28, 1983, Ser. No. 546,243
Claims priority, application Switzerland, Nov. 4, 1982, 6418/82; Sep. 6, 1983, 4873/83
Int. Cl.[4] C07D *213/64*; C07C *145/02*; A01N *43/40, 41/02*
U.S. Cl. 71—94 **21 Claims**

1. A compound of the formula



I

wherein A is N or CR^3,

R^1 is halogen or trifluoromethyl,

R^2 and R^3 independently of one another are hydrogen or halogen,

R^4 is halogen, nitro,

R^5 is hydrogen or methyl,

R^6 is C_{1-6}-alkyl and

R^7 is C_{1-6}-alkyl, phenyl, or phenyl substituted with halogen, C_{1-4}-alkyl, C_{1-4}-alkoxy and/or nitro,

n is 0,

X is oxygen.

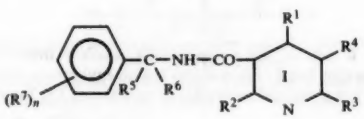
13. The method for combatting weeds which comprises applying to the locus to be protected, a herbicidally effective amount of the compound of claim 1.

4,556,414
HERBICIDAL DIHYDROPYRIDINE AMIDES

Dominique Ambrosi, Charbonniers-les-Bains, and de Reinach Hirtzbach Francois, Lyons, both of France, assignors to Rhone-Poulenc Agrochimie, Lyon, France

Filed Jun. 23, 1982, Ser. No. 391,439
Claims priority, application France, Jun. 25, 1981, 81 12698
Int. Cl.[4] A01N *43/40*; C07D *211/90*
U.S. Cl. 71—94 **10 Claims**

1. A compound of the formula:



(I)

wherein:

R^1, R^2 and R^3, which are identical or different, represent the hydrogen atom, a lower alkyl radical, a lower alkoxy radical or an alkoxyalkyl radical having from 2 to 8 carbon atoms;

R^4 represents a carboxyl radical or salt thereof or the radical —$COOR^8$, wherein R^8 represents a lower alkyl radical, or the cyano radical, a lower cyanoalkyl radical or an alkoxyalkyl radical having from 2 to 8 carbon atoms;

R^5 and R^6 represent the hydrogen atom or a lower alkyl radical or together form a single divalent alkylene radical having from 2 to 5 carbon atoms or one of radicals R^5 and R^6 represent a cyano radical;

R^7 represents a halogen atom, a lower alkyl radical, a lower alkoxy radical, a lower alkenyl radical, a lower alkenyloxy radical wherein the lower alkyl radical, alkoxy radical,

alkenyl radical and lower alkenyloxy radical is optionally halogen-substituted, a nitro or cyano radical or an amino radical which is optionally substituted by one or two identical or different lower alkyl radicals or by a radical —CO—R^9, wherein R^9 represents a lower alkyl radical, lower alkoxy radical, lower alkylamino radical or dialkylamino radical, wherein each of the lower alkyl radicals, lower alkoxy radicals, lower alkylamino radicals or dialkylamino radicals are identical or different and contain at most 6 carbon atoms; or, when n is greater than 1, two of R^7 may together represent an alkylenedioxy group having from 1 to 4 carbon atoms;

n is zero or a positive interger equal to at most 5; and

the heterocyclic ring

represents the dihydropyridine nucleus

5. A herbicidal composition which contains, as the active ingredient, a herbicidally effective amount of at least one compound according to calim 1, in an inert agriculturally acceptable carrier.

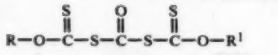
4,556,415

BIS-(ALKOXY)TETRATHIOTRICARBOXYLATES AND USE AS HERBICIDES THEREOF

John E. Franz, Crestwood, and Kurt E. Zwikelmaier, St. Louis, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Apr. 15, 1985, Ser. No. 723,237
Int. Cl.[4] C07C *154/02*; A01N *37/00, 37/12*
U.S. Cl. 71—100 **28 Claims**

1. A compound represented by the structure



wherein R and R' are independently selected from alkyl groups having 1 to 8 carbon atoms and alkenyl groups having 2 to 8 carbon atoms and cycloalkyl groups having 3 to 8 carbon atoms.

20. A method which comprises contacting weeds with a herbicidally effective amount of the compound of claim 1.

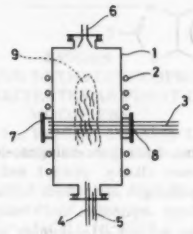
4,556,416

PROCESS AND APPARATUS FOR MANUFACTURING FINE POWDER

Eiji Kamijo, and Matsuo Higuchi, both of Itami, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Apr. 30, 1984, Ser. No. 605,489
Claims priority, application Japan, May 7, 1983, 58-79728
Int. Cl.[4] B22F *9/00*
U.S. Cl. 75—0.5 B **5 Claims**

1. A process for manufacturing a fine powder of a metal or ceramics comprising the steps of mixing a gas of volatile metal compound and/or an evaporated metal and a reaction gas in a



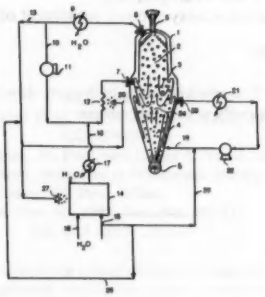
gaseous state ionizing the mixture and heating the ionized mixture with a laser beam to produce the powder.

4,556,417

PROCESS FOR THE DIRECT REDUCTION OF IRON ORES

Enrique R. Martinez-Vera, and Alberto Bustani-Adem, both of Monterrey, Mexico, assignors to Hylsa, S.A., Monterrey, Mexico

Filed May 17, 1983, Ser. No. 495,422
Int. Cl.[4] C21B *13/02*
U.S. Cl. 75—35 **20 Claims**



1. A process for reducing particulate iron ore to sponge iron in a vertical shaft, moving bed reactor having a reduction zone in the upper portion of said reactor with an inlet in the lower portion of said zone and an outlet in the upper portion of said zone and further having a cooling zone similarly with a lower inlet and upper outlet, comprising

(a) feeding iron ore to said reduction zone,

(b) forming a reducing gas loop by feeding to said reduction zone inlet as a first gas stream a hot reducing gas composed largely of carbon monoxide and hydrogen and also containing water and carbon dioxide, causing said reducing gas to flow upwardly through said reduction zone to reduce the iron ore therein to sponge iron, withdrawing reducing gas from the reduction zone via said outlet as an effluent gas, cooling the effluent gas and removing water therefrom, heating and recycling at least a portion of said effluent gas to said reduction zone inlet to complete said reducing gas loop,

(c) forming as a second gas stream a cooling gas loop by causing a cooling gas containing a substantial amount of methane with at most only a small amount of carbon dioxide and water relative to said latter methane to flow upwardly through said cooling zone to cool the sponge iron therein, withdrawing a portion of the cooling gas from the cooling zone outlet as an effluent gas, cooling the

latter effluent gas and removing water therefrom, and recycling the resulting cooled gas to the cooling zone inlet,

(d) feeding to said cooling gas loop as a make-up gas a third gas stream largely composed of methane with at most only a small amount of carbon dioxide and water relative to said latter methane,

(e) causing a portion of said second stream to form a fourth gas stream similarly containing a substantial amount of methane that flows upwardly from said cooling zone to said reduction zone and mixes with said first gas stream adjacent said reduction zone inlet,

(f) feeding to said reducing gas loop as a make-up gas a fifth gas stream mainly composed of hydrogen and carbon monoxide, and

(g) discharging cooled reduced iron ore in the form of sponge iron from said cooling zone,

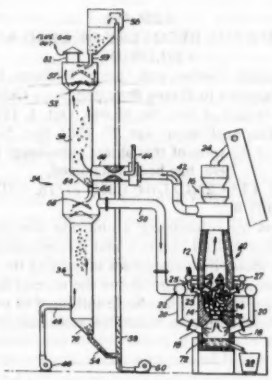
whereby methane in said fourth stream is mainly reformed endothermically adjacent said reduction zone inlet by the carbon dioxide and water present in said first gas stream and thus initiates an early and rapid cooling of the descending reduced ore particulates at the point of mixing, thus decreasing the tendency of the reduced ore particles to agglomerate, and also, decreasing the amount of externally generated reducing make-up gas needed for the reducing gas loop.

4,556,418

PROCESS FOR MELTING A FERROUS BURDEN

Andrew J. Syska, Marblehead, Mass., assignor to Thermal Systems Engineering, Inc., Marblehead, Mass.

Filed Oct. 3, 1984, Ser. No. 657,121
Int. Cl.⁴ C21B *11/02*
U.S. Cl. 75—43 **20 Claims**



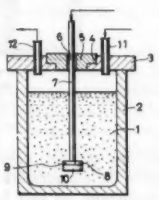
1. A process for melting a ferrous burden comprising introducing a ferrous burden together with fluxes and additions into the upper region of a shaft furnace, introducing primary oxidant into a heat recovery device, heating said primary oxidant in said heat recovery device; introducing said heated primary oxidant together with fuel into high temperature burners associated with the lower region of said shaft furnace, the oxygen to carbon ratio of the primary oxidant and fuel falling within the range of 0.85 to 1.4; combusting said heated primary oxidant and said fuel in said high temperature burners to produce a reducing atmosphere at a temperature in excess of 3200° F. (1760° C.) and delivering said atmosphere to the lower region of said shaft furnace, said reducing atmosphere containing at least carbon dioxide, carbon monoxide, hydrogen, water vapor and nitrogen; directing said atmosphere through said lower region of said shaft furace and into said upper region of said shaft furnace whereby said ferrous burden in said lower region of said shaft furnace is melted and said ferrous burden in said upper region of said shaft furnace is preheated; introducing a desired amount of secondary oxidant into said upper region of said shaft furnace; combusting a portion of the carbon monoxide and hydrogen contained in the reducing atmosphere from the lower region of said shaft furnace so as to produce a gas temperature at least 150° F. (83° C.) above the metal temperature at the entrance to the melting zone in said lower region of said shaft furnace and a top gas leaving said shaft furnace at a temperature in the range of 600° to 1400°to 1400° F. (316° C. to 760° C.) while preheating the said ferrous burden in said upper region of said shaft furnace to a temperature in the range of 1200° to 1800° F. (648° C. to 982° C.); introducing said top gas and tertiary oxidant into an afterburner; combusting said top gas and said tertiary oxidant to provide a heated flue gas and passing said heated flue gas in heat exchange relationship with said primary oxidant.

4,556,419

PROCESS FOR TREATING MOLTEN ALUMINUM TO REMOVE HYDROGEN GAS AND NON-METALLIC INCLUSIONS THEREFROM

Ryotatsu Otsuka, Osaka; Sigemi Tanimoto, and Kazuo Toyoda, both of Izumi, all of Japan, assignors to Showa Aluminum Corporation, Sakai, Japan

Filed Oct. 19, 1984, Ser. No. 663,056
Claims priority, application Japan, Oct. 21, 1983, 58-197848; Oct. 21, 1983, 58-197847
Int. Cl.⁴ C22B *21/06*
U.S. Cl. 75—68 R **8 Claims**



1. A process for treating molten aluminum to remove hydrogen gas and non-metallic inclusions therefrom comprising the steps of maintaining an atmosphere containing BF_3 gas in a treating vessel above the surface of molten aluminum placed therein, introducing a treating gas into the molten aluminum, and removing floating non-metallic inclusions and treating gas containing hydrogen gas from the surface of the molten aluminum.

4,556,420

PROCESS FOR COMBINATION METAL REDUCTION AND DISTILLATION

Harmon A. Evans, Moses Lake, Wash., and Young Jin Kwon, Fruit Heights, Utah, assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 373,588, Apr. 30, 1982, abandoned. This application Oct. 27, 1983, Ser. No. 546,601
Int. Cl.⁴ C22B *34/10*
U.S. Cl. 75—84.5 **1 Claim**

1. In a reduction process wherein a furnace having an inner liner is used and wherein one of $TiCl_4$, $HfCl_4$ or $ZrCl_4$ to be reduced reacts with Mg to produce, by way of a redox reaction, a desired corresponding solid Ti, Hf or Zr metal phase and molten $MgCl_2$, the specific improvement comprising.

(a) initially charging a furnace having a first vessel containing said inner liner having at least one opening in the lower portion thereof and said first vessel being in fluid communication with a second vessel of said furnace, said charging being with sufficient $MgCl_2$ to establish a molten salt seal at the bottom of said inner liner;

(b) establishing and maintaining a temperature and pressure

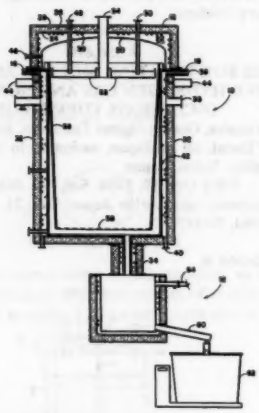
within said furnace consistent with promoting said desired redox reaction;

(c) at least periodically adding said $TiCl_4$, $HfCl_4$ or $ZrCl_4$ to be reduced and at least a stoichiometric amount of Mg to said furnace;

(d) at least periodically draining a portion of said molten $MgCl_2$ to readjust said molten salt surface whereby the amount of said corresponding solid reduced Ti, Hf or Zr that can be formed by the redox reaction is increased while the seal is maintained;

(e) upon completion of said redox reaction, draining said molten $MgCl_2$ salt and at least a portion of the excess Mg from said furnace;

(f) removing unreacted Mg metal from said furnace by distillation by maintaining said first vessel of said furnace at a temperature above the temperature of said second vessel while pulling a vacuum on said furnace, thus isolating purified solid Ti, Hf or Zr metal;



(g) recovering said liner and said purified solid Ti, Hf or Zr metal from said furnace, whereby the production of said Ti, Hf or Zr metal outside the liner is avoided, thus facilitating removal of the liner and reduction and whereby distillation of large quantities of high purity metal is achieved; and

(h) loading and melting reducing metal salt in said first vessel and then melting reducing metal and reducing metal salt remaining in said second vessel from a previous run, whereby reducing metal floats up into the inner liner of said first vessel thereby recycling said reducing metal.

4,556,421

METHOD OF OPERATING A SYNTHESIS GAS-ORE REDUCTION PROCESS

Klaus Knop, Geldern-Hartefeld, and Peter Heinrich, Oberhausen, both of Fed. Rep. of Germany, assignors to M.A.N. Maschinenfabrik Augsburg-Nürnberg Aktiengesellschaft, Fed. Rep. of Germany

Filed Sep. 28, 1983, Ser. No. 536,447

Claims priority, application Fed. Rep. of Germany, Oct. 8, 1982, 3237334

Int. Cl.⁴ C22B *5/12;* **C10J** *3/46*

U.S. Cl. 75—91 **9 Claims**

1. A method of operating a synthesis gas reactor comprising:

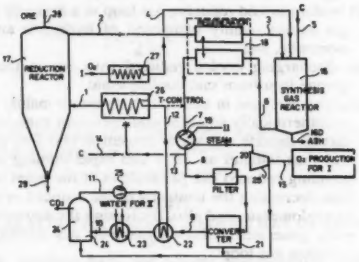
supplying a carbonaceous material to the synthesis gas reactor in addition to an oxygen stream so as to form a reaction producing a hot synthesis gas;

adding ore to a reduction reactor and generating an off gas;

directing the synthesis gas to a regenerator to partially cool said synthesis gas and thereby accumulate heat in said regenerator;

directing the off gas to said regenerator to heat said off gas to above around 1100° C. by transferring said accumulated heat from said regenerator thereto;

alternating the passage of the off gas and the synthesis gas through said regenerator so that the off gas always passes through a previously heated regenerator and the hot synthesis gas always passes through a previously cooled regenerator;



using the partially cooled synthesis gas to reheat liquid for a vapor generator and thereby further cool said partially cooled synthesis gas;

reheating said further cooled synthesis gas and then supplying said reheated synthesis gas to the reduction reactor; and

supplying the heated off gas from the regenerator to the synthesis reactor.

4,556,422

PROCESS FOR THE RECOVERY OF LEAD AND SILVER CHLORIDES

James E. Reynolds, Golden, and Alan R. Williams, Denver, both of Colo., assignors to Hazen Research, Inc., Golden, Colo.

Continuation-in-part of Ser. No. 80,444, Oct. 1, 1979, Pat. No. 4,276,084. This application Apr. 20, 1981, Ser. No. 255,649

The portion of the term of this patent subsequent to Jun. 30, 1998, has been disclaimed.

Int. Cl.⁴ C22B *13/04;* **C01G** *21/16, 5/02*

U.S. Cl. 75—101 R **27 Claims**

1. A process for solubilizing a chloride selected from the group consisting of lead chloride and a combination of silver and lead chlorides which comprises subjecting the chloride to a brine leach at a temperature above the normal boiling point under a pressure above atmospheric sufficient to prevent boiling for a sufficient time to solubilize substantially all of the chloride.

4,556,423

AUSTENITE STAINLESS STEELS HAVING EXCELLENT HIGH TEMPERATURE STRENGTH

Tatsuo Kondo, Ibaragi; Manabu Tamura, Tokai; Masayuki Tanimura, Yokohama, and Yoshiki Kamemura, Tokyo, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha and Japan Atomic Energy Research Institute, both of Tokyo, Japan

Filed Dec. 29, 1982, Ser. No. 454,362

Claims priority, application Japan, Jan. 8, 1982, 57-1000

Int. Cl.⁴ C22C *38/16*

U.S. Cl. 75—125 **6 Claims**

1. Austenite stainless steel having excellent high temperature strength consisting essentially of 0.02–0.2% by weight of carbon, 2% by weight or less of silicon, 2% by weight or less of manganese, 10–25% by weight of chromium, 10–35% by weight of nickel wherein a portion or whole of the nickel can be replaced with the same quantity of cobalt, 1–8% by weight

of molybdenum wherein a portion or whole of the molybdenum can be replaced with the same quantity of tungsten, 2–7% by weight of copper, 0.6% by weight or less of aluminum, 0.003–0.05% by weight of at least one of magnesium and yttrium, the total of said chromium, nickel, molybdenum and copper being a maximum of 50% of said steel, and the balance of iron and inherent impurities.

4,556,424

CERMETS HAVING TRANSFORMATION-TOUGHENING PROPERTIES AND METHOD OF HEAT-TREATING TO IMPROVE SUCH PROPERTIES

Ramamurthy K. Viswanadham, Houston, Tex., assignor to Reed Rock Bit Company, Houston, Tex.

Filed Oct. 13, 1983, Ser. No. 541,754

Int. Cl.[4] C22C *38/04, 38/08, 38/18*

U.S. Cl. 75—240 **15 Claims**

1. A powder metallurgy composite material comprising grains of a relatively hard, abrasion resistant material consisting essentially of a transition metal compound, and a binder material for binding said grains together consisting essentially of iron, carbon, and at least one element selected from the group of nickel, manganese, aluminum, and chromium, said binder material being metastable and transformable at ambient temperature by the application of mechanical force of at least a predetermined magnitude from an initial state in which the major phase of the binder material is austenitic to a second state in which the major phase of the binder material is martensitic, whereby said binder material, while undergoing said transformation, absorbs mechanical energy applied to the composite material for increasing its fracture toughness and its resistance to fatigue crack nucleation and propagation.

11. A method of heat treating a powder metallurgy composite material comprising grains of a relatively hard, abrasion resistant material consisting essentially of a transition metal compound, and a binder material for binding said grains together consisting essentially of iron, carbon, and at least one element selected from the group of nickel, manganese, aluminum, and chromium, said binder material being metastable and transformable, upon being cooled to a transformation temperature below ambient temperature, from an initial austenitic state in which the major phase of the binder is austenitic to a second martensitic state in which the major phase of the binder is martensitic, said transformation causing deformation of the binder material and the formation of dislocations therein due to volume changes and shear, said cooled binder material, upon being heated to a temperature above said transformation temperature, reverting to an austenitic state in which the major phase of the binder material is austenitic, said reverted austenite retaining at least some measure of said deformation and dislocations and enhancing the fracture toughness and resistance to fatigue crack nucleation and propagation of the composite material, the method comprising the steps of:

(a) cooling the composite material to a temperature at least as low as said transformation temperature and below approximately −100° C. to transform the binder material to its said second martensitic state and to cause deformation of the binder material;

(b) then heating the composite material to a temperature above approximately +400° C. to cause the binder material to revert to an austenitic state while retaining at least some measure of said deformation; and

(c) then cooling the composite material to ambient temperature.

4,556,425

ANTI-RUST AGENT, METHOD OF PRODUCING THE SAME AND METHOD OF PREVENTING CORROSION

Jarl J. Lindberg; Váinó Erá, both of Vantaa, and Erkki Ström, Helsinki, all of Finland, assignors to Ruoste-Esto Oy, Finland

Continuation-in-part of Ser. No. 157,969, Jun. 9, 1980, abandoned, which is a continuation-in-part of Ser. No. 20,413, Mar. 14, 1979, abandoned. This application Aug. 7, 1981, Ser. No. 291,096

Claims priority, application Finland, Mar. 21, 1978, 780892

Int. Cl.[4] C09D *5/08*

U.S. Cl. 106—14.23 **2 Claims**

1. Method of preventing corrosion, which comprises applying to the surface of a material subject to corrosion an anti corrosion effective amount of an anti-rust agent comprising tall oil pitch neutralized with calcium oxide, said tall oil pitch having an acid number between 0 and 7 mg KOH per g.

4,556,426

FUNGICIDAL GROUT COMPOSITION

Joseph J. Chesney, Jr., Plainsboro; Scott C. Broney, Trenton, and George A. Ely, Ringoes, all of N.J., assignors to Tile Council of America, Inc., Princeton, N.J.

Continuation of Ser. No. 503,859, Jun. 13, 1983, abandoned, which is a continuation of Ser. No. 309,574, Oct. 8, 1981, abandoned. This application Jun. 5, 1984, Ser. No. 617,390

Int. Cl.[4] C09D *5/16*

U.S. Cl. 106—18.32 **8 Claims**

1. A fungicidal grout composition for mixing with water which comprises:

(a) from about 50 to about 99% by weight of a wettable Portland cement;

(b) from about 0.25 to 12.0% by weight of a dry blended mixture, said mixture comprising from about 50% to about 90% by weight of a halogenated aromatic dinitrile and from about 10% to about 50% by weight of a finely divided inert solid fungicidal carrier;

(c) from 0 to 50% by weight of a water insoluble filler;

(d) from about 0.2 to about 0.5% by weight of a hygroscopic agent; and

(e) from 0 to about 10% by weight of a coloring agent.

4,556,427

USE OF HUMATES IN PRINTING INKS

Harry D. Lewis, Jacksonville, Fla., assignor to Union Camp Corporation, Wayne, N.J.

Filed Dec. 12, 1983, Ser. No. 560,534

Int. Cl.[4] C09D *11/02*

U.S. Cl. 106—20 **10 Claims**

1. In a printing ink composition which comprises a pigment, a binder and a carrier, the improvement which comprises; the presence of a humate selected from the group consisting of monovalent alkali metal humates and ammonium humate in an aqueous dispersion stabilized by adjustment of the pH to a neutral or slightly alkaline state.

4,556,428

METHOD FOR THE MANUFACTURE OF CALCAREOUS BONDING AGENTS, PARTICULARLY CEMENT

Albrecht Wolter, Cologne, and Horst Herchenbach, Hennef, both of Fed. Rep. of Germany, assignors to Klöckner-Humboldt-Deutz AG, Fed. Rep. of Germany

Filed May 25, 1984, Ser. No. 614,143

Claims priority, application Fed. Rep. of Germany, May 26, 1983, 3319083

Int. Cl.[4] C04B *7/02*

U.S. Cl. 106—102 **7 Claims**

1. A method for the manufacture of cement which comprises:

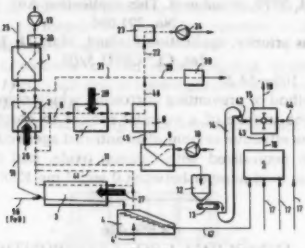
preheating raw cement meal,

at least partially calcining the preheated meal,

dividing the thus treated meal into a primary stream and a branch stream,

burning the particles in said primary stream in a rotary kiln to form clinker,

suspending the particles in said branch stream in a combustible gas,



burning the suspended particles in said branch stream in a suspension reactor in parallel with said rotary kiln to produce an airborne dust clinker,

cooling both the clinker from said rotary kiln and said airborne dust clinker,

grinding the clinker from said rotary kiln, and

combining the ground clinker with the airborne dust clinker.

4,556,429

LOW-CARIOGENIC SWEETNERS

Ichiro Takazoe; Kosei Ohta, both of Tokyo; Junichi Shimizu, Yokohama; Kazumasa Suzuki, Ayase; Tatsuya Iwakura, Yokohama, and Yoshikazu Nakajima, Yamato, all of Japan, assignors to Mitsui Sugar Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 313,679, Oct. 21, 1981, abandoned. This application Jul. 14, 1983, Ser. No. 513,947

Claims priority, application Japan, Oct. 23, 1980, 55-147553

Int. Cl.[4] C13F *3/00*; C13K *13/00*

U.S. Cl. 127—30 **1 Claim**

1. A low-cariogenic sweetner which consists of a mixture of sucrose and palatinose wherein the proportion of palatinose is from 20 to 35 parts by weight per 100 parts by weight of sucrose.

4,556,430

PROCESS FOR HYDROLYSIS OF BIOMASS

Alvin O. Converse, Norwich, Vt., and Hans E. Grethlein, Hanover, N.H., assignors to Trustees of Dartmouth College, Hanover, N.H.

Continuation of Ser. No. 428,592, Sep. 20, 1982, abandoned. This application Nov. 5, 1984, Ser. No. 668,672

Int. Cl.[4] C13K *1/02*

U.S. Cl. 127—36 **23 Claims**

23. A process for hydrolysis of biomass to convert carbohydrate components to sugar, the process comprising: mixing particulate biomass with a sufficient amount of an aqueous acid to produce a wet meal; introducing a sufficient amount of a nonaqueous liquid carrier to the biomass to produce a pumpable slurry and to concentrate sugar in the aqueous phase of said slurry; said non-aqueous liquid being immiscible in water and continuously feeding the slurry through a reaction zone whose pressure and temperature are controlled for a residence time of about 4 to 15 seconds to effect hydrolysis of the carbohydrate component of the biomass to provide decomposition products that include sugar.

4,556,431

PROCESS FOR HYDROLYZING CELLULOSE-CONTAINING MATERIAL WITH GASEOUS HYDROGEN FLUORIDE

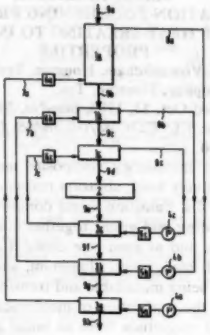
Rüdiger Erckel, Eppstein; Raimund Franz, Kelkheim; Rolf Woernle, Bad Soden am Taunus, and Theodor Riehm, Heidelberg, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Continuation of Ser. No. 434,587, Oct. 15, 1982, abandoned. This application Feb. 28, 1985, Ser. No. 706,919

Claims priority, application Fed. Rep. of Germany, Oct. 24, 1981, 3142214

Int. Cl.[4] C13K *1/02*

U.S. Cl. 127—37 **11 Claims**



1. A continuous process for hydrolyzing cellulose-containing material to obtain hydrolytic cleavage of cellulose macromolecules and formation of smaller, water-soluble molecules, in which sorption of gaseous hydrogen fluoride occurs followed by desorption of the HF for re-use in the process, said process comprising:

sorption of the HF by the cellulose-containing material in n sorption steps carried out in n sorption zones for reaction with HF and hydrolytic cleavage of the cellulose-containing material, said n sorption steps being carried out at a temperature above the boiling point of HF; the cellulose-containing material being introduced into the first sorption zone and then consecutively passed, through gas-tight valves, into the second through nth sorption zones;

thereafter freeing the thus-digested material from the sorbed HF in n desorption steps by passing said material, through gas-tight valves, consecutively through n desorption zones, the number n of sorption steps and the number n of desorption being the same,

said sorption and desorption steps each being carried out in reactors separated from each other in a gas-tight manner, except that the first sorption zone is paired with the nth desorption zone by means of a first gas circuit, through which flows gaseous HF and an inert carrier gas, gaseous HF and inert carrier gas flowing through said first gas circuit from the nth desorption zone to the first sorption zone and from the first sorption zone through said first gas circuit to the nth desorption zone; similarly, each of the second through nth sorption zones is paired with each of the (n−1)th through the first desorption zones, respectively, by a similar gas circuit, for each said pair, the HF concentration increasing in each gas circuit from the first to the nth gas circuit; and

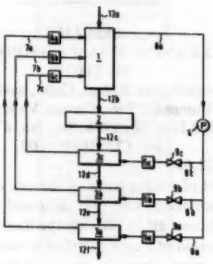
removing the thus digested and thus desorbed material from the nth desorption zone.

4,556,432

PROCESS FOR HYDROLYZING CELLULOSE-CONTAINING MATERIAL WITH GASEOUS HYDROGEN FLUORIDE

Rüdiger Erckel, Eppstein; Raimund Franz, Kelkheim; Rolf Woernle, Bad Soden am Taunus, and Theodor Riehm, Heidelberg, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Continuation of Ser. No. 434,582, Oct. 15, 1982, abandoned.
This application Mar. 12, 1985, Ser. No. 710,533
Claims priority, application Fed. Rep. of Germany, Oct. 24, 1981, 3142215
Int. Cl.[4] C13K 1/02
U.S. Cl. 127—37 14 Claims



1. A continuous process for hydrolyzing cellulose-containing material to obtain hydrolytic cleavage of cellulose macromolecules and formation of smaller, water-soluble molecules, in which sorption of gaseous hydrogen flouride occurs followed by desorption of the HF, said process comprising:

carrying out the sorption of the HF by the cellulose-containing material at a temperature above the boiling point of HF in a sorption step, and then removing the sorbed HF by the action of heated gas streams in n desorption steps, wherein n is a whole number and wherein the sorption and desorption steps are carried out in zones separated from each other in a gas-tight manner; the cellulose-containing material being passed through a gas-tight valve into the sorption zone and then passed therethrough such that said cellulose-containing material acquires an increasing level of HF sorption in said sorption zone;

passing said material containing sorbed HF, through gas-tight valves, consecutively through the first through the nth desorption zones;

the desorption in each desorption zone being carried out by the said action of one of n heated gas streams, each said gas stream comprising an inert carrier gas which becomes enriched with HF gas due to the HF liberated during desorption, resulting in n HF-enriched gas streams varying in HF concentration;

passing the HF-enriched gas stream of lowest HF concentration to the sorption zone to act on cellulose-containing material having the lowest concentration of sorbed HF and passing the HF-enriched gas stream of highest concentration to the sorption zone to act on the material having the highest concentration of sorbed HF;

conveying from the sorption zone a total gas stream obtained from the individual gas streams in the sorption zone, after completion of sorption, said total gas stream being substantially depleted of HF, such that said total gas stream, or subdivided portions thereof, can be circulated through said desorption zones; and

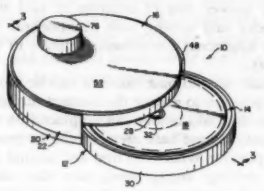
removing thus hydrolyzed and thus desorbed material from the nth desorption zone.

4,556,433

APPARATUS AND METHOD FOR CLEANING DIGITAL AUDIO DISCS

Eivind Clausen, Bellingham, Wash., assignor to Allsop, Inc., Bellingham, Wash.

Filed Apr. 16, 1984, Ser. No. 600,495
Int. Cl.[4] B08B 7/00; G11B 3/58
U.S. Cl. 134—6 25 Claims



1. An apparatus for cleaning a generally planar surface of an object in a wiping path having wiping path components from a peripheral portion of said surface to a middle portion thereof and from the middle portion back to the peripheral portion of said surface, said apparatus comprising:

a. a first base member;

b. a support member having an upwardly facing support contact surface, generally occupying a contact plane, to support the object to be cleaned at a support location and expose the surface of said object at a contact location, said support member being mounted to the first base member for rotation about a generally vertical central support axis;

c. a second base member mounted in said apparatus so as to be movable relative to said first base member between a first operating position and a second non-operating position away from said first base member along a path characterized in that movement from the operating position is at least initially along a path having a substantial upward vertical alignment component;

d. a cleaning member having a downwardly facing circumferential cleaning surface and being mounted to said second base member in a manner that with the second base member in its operating position, at least a portion of the cleaning surface is positioned at the contact location so as to be in contact with the object which is at the support location, with said cleaning member being rotatable about a vertical central cleaning axis which is spaced from said support axis and located within said circumferential cleaning surface, and so that said cleaning member is movable with said second base member when said second base member moves from its operating position to its non-operating position, in a manner that when the second base member is in its non-operating position, said cleaning member is removed from said contact location so as to permit said object to be placed at, and removed from, said contact location;

e. drive means operatively connected between the support member and the cleaning member in a manner that rotation of one of the support member and the cleaning member causes a relative rotation of the other of the support member and the cleaning member in a manner that the support member rotates relative to said first base member about said central support axis and the cleaning member rotates relative to said second base member about said central cleaning axis so that the cleaning surface of the cleaning member moves along said wiping path, and with said support member rotating, said wiping path is being shifted relative to said support member due to rotation of said support member;

f. said drive means comprising at least a first gear connected to said support member, and a second gear connected to said cleaning member and movable therewith when said second base member with said cleaning member is moved between said operating and non-operating positions, said

drive means being characterized so that with the second base member in said operating position, the first and second gears are in operative driving engagement, and with the second base member in the non-operating position, the second gear is out of operative driving engagement with the first gear;

g. said drive means being a speed reducing transmission which is characterized in that rotation of said cleaning member at a first rotational rate of speed causes a relatively slower rate of rotation of said support member, whereby said wiping path components have substantial radial alignment components relative to said central support axis;

whereby said second base member can be moved to the non-operating position to expose the contact surface of the support member so that said object can be placed on the contact surface, and said second base member can be moved back to the operating position where the first and second gears come into operative driving engagement, and the cleaning member comes into cleaning engagement with said object.

12. An apparatus for cleaning a generally planar surface of an object in a wiping path having wiping path components from a peripheral portion of said surface to a middle portion thereof and from the middle portion back to the peripheral portion of said surface, said apparatus comprising:

a. a first base member;

b. a support member having an upwardly facing support contact surface, generally occupying a contact plane, to support the object to be cleaned at a support location and expose the surface of said object at a contact location, said support member being mounted to the first base member for rotation about a generally vertical central support axis;

c. a second base member mounted in said apparatus so as to be movable relative to said first base member between a first operating position and a second non-operating position away from said first base member along a path characterized in that movement from the operating position is at least initially along a path having a substantial upward vertical alignment component;

d. a cleaning member having a downwardly facing circumferential cleaning surface and being mounted to said second base member in a manner that with the second base member in its operating position, at least a portion of the cleaning surface is positioned at the contact location so as to be in contact with the object which is at the support location, with said cleaning member being rotatable about a vertical central cleaning axis which is spaced from said support axis and located within said circumferential cleaning surface, and so that said cleaning member is movable with said second base member when said second base member moves from its operating position to its non-operating position, in a manner that when the second base member is in its non-operating position, said cleaning member is removed from said contact location so as to permit said object to be placed at, and removed from, said contact location;

e. drive means operatively connected between the support member and the cleaning member in a manner that rotation of one of the support member and the cleaning member causes a relative rotation of the other of the support member and the cleaning member in a manner that the support member rotates relative to said first base member about said central support axis and the cleaning member rotates relative to said second base member about said central cleaning axis so that the cleaning surface of the cleaning member moves along said wiping path, and with said support member rotating, said cleaning path is being shifted relative to said support member due to rotation of said support member;

f. said drive means being a speed reducing gear transmission comprising a plurality of gear members which, with the second base member in said operating position, have respective axes of rotation which are vertically aligned so that said gear members, said support member and said cleaning member rotate in respective planes substantially parallel to one another, said plurality of gear members comprising at least a first gear supported from said first base member and a second gear supported from, and movable with, said second base member, with said gears coming into driving engagement when the second base member is moved into said first operating position, and with said gears moving out of driving engagement when the second base member is moved out of said first operating position

g. said speed reducing gear transmission being characterized in that rotation of said cleaning member at a first rotational rate of speed causes a relatively slower rate to rotation of said support member, whereby said wiping path components have substantial radial alignment components relative to said central support axis.

4,556,434

SEWER CLEANING FOAM COMPOSITION AND METHOD

Stanley M. Woogerd, San Rafael, Calif., assignor to Airrigation Engineering Company, Inc., Carmel Valley, Calif.

Filed Dec. 10, 1984, Ser. No. 679,815
Int. Cl.[4] B08B 9/02
U.S. Cl. 134—22.14 **11 Claims**

11. A method of killing roots in sewers, comprising

making a foam containing two thousand parts by weight of water, sufficient air to provide the foam, and one hundred parts by weight of a concentrated formulation comprising, by weight, approximately the following:

A. 74.15 parts of a solution made up essentially of
37% sodium methyldithiocarbamate
63% water,

B. 22.31 parts of a solution made up essentially of
15% isopropanol
12.4% water
20.2% sodium dihexyl sulfosuccinate
13.3% nine mole ethylene oxide adduct of nonyl phenol
11.7% sodium 2-ethyl hexyl sulfate
9.2% triethanol amine sulfonate
7.5% tetrasodium N—1,2 dicarboxy ethyl—N octadecyl sulfosuccinamate
4.7% coconut oil superamide
4.6% isopropyl or dimethyl amine sulfonate
1.4% tetrasodium ethylene diamine acetic acid, and

C. 3.54 parts of a dry material made up essentially of
50% dichlobenil
50% wettable clay, and

distributing the foam along the sewer in quantity sufficient to cover the roots in the sewer.

4,556,435

METHOD FOR PREPARING CORES AND THE LIKE MADE FROM METALLIC OXIDES

Akira Shibata, Yokohama, Japan, assignor to Chugai Denki Kogyo, K.K., Tokyo, Japan

Filed Oct. 29, 1984, Ser. No. 666,268
Int. Cl.[4] C23F 7/04
U.S. Cl. 148—6.35 **4 Claims**

1. A method for making cores and the like from metallic oxides for use as electric, electronic, or magnetic elements for appliance; which comprises

preparing metal alloy cores of a desired configuration from metallic constituents which form metallic oxides when they are baked,

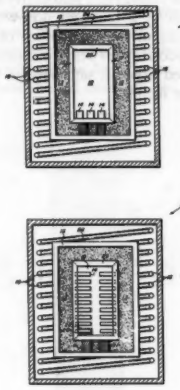
covering each of said alloy cores at least in part with a film of silver or an alloy thereof, and

baking the coated cores in an oxygen atmosphere for a predetermined time and at a predetermined temperature to produce uniform electrical characteristics by controlling the diffusion of oxygen thru the silver film.

4,556,436
METHOD OF PREPARING SINGLE CRYSTALLINE CUBIC SILICON CARBIDE LAYERS

Arrigo Addamiano, Alexandria, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 22, 1984, Ser. No. 643,327
Int. Cl.[4] H01L *21/205, 29/04*
U.S. Cl. 148—175 **14 Claims**

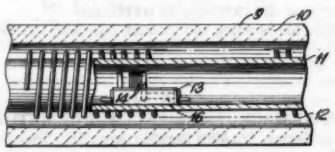


1. A method of making very pure cubic silicon carbide comprising the steps of:
loading a first inner graphite cup of a Lely-type furnace, while cold, with a large number of crystal forms of SiC that are used as substrates;
sealing the first cup with a graphite lid;
inserting the first cup into a second graphite cup and inserting them into the furnace;
filling the area between the first cup and the second cup with SiC;
Heating the first cup by induction heating to between 2300° C. and 2700° C. until an atmosphere saturated with Si, C, Sic_2 and Si_2C is created, said heating step taking no longer than 30 minutes; and
cooling the furnace as quickly as possible to a temperature less than 1800° by turning off the induction heating.

4,556,437
METHOD OF DIFFUSING SILICON SLICES WITH DOPING MATERIALS

Casper S. Molee, Bloomfield, N.J., assignor to Victory Engineering Corporation, Springfield, N.J.

Filed Jul. 16, 1984, Ser. No. 631,624
Int. Cl.[4] H01L *21/223*
U.S. Cl. 148—188 **11 Claims**

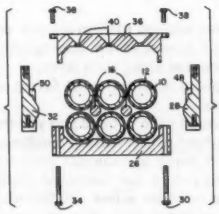


1. The method of diffusing dopant material into the major surfaces of silicon crystal slices comprising the steps of:
(a) disposing a plurality of silicon crystal slices with their major faces in substantial parallelism;
(b) placing a solid wafer of dopant material between at least two adjacent major faces of the said crystal slices so as to substantially overlie the said major faces;
(c) placing the aforesaid silicon crystal slices and dopant material together as an assembly within a boat in the presence of ambient air;
(d) clamping the said assembly together to provide a firm side-by-side contact between the silicon crystal slices and the dopant wafers;
(e) advancing the boat containing the assembly into a furnace, open to air, at an elevated temperature;
(f) maintaining the assembly within the heating zone of the furnace at said elevated temperature until the dopant has diffused into the major surfaces of the silicon crystal slices; and
(g) slowly withdrawing the boat together with its assembly of silicon crystal slices from said furnace.

4,556,438
LIGHTWEIGHT COMPOSITE LAUNCHER POD PRODUCTION PROCESS

Lawrence D. Hoffmeister, New Market, and Richard J. Thompson, Huntsville, both of Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 20, 1984, Ser. No. 642,845
Int. Cl.[4] B31C *13/00;* **B32B** *5/18;* **B65H** *81/00*
U.S. Cl. 156—79 **4 Claims**



1. A process for producing lightweight composite launcher pods comprising filament winding the desired number of launch tubes on the desired number of mandrels, accurately mounting the mandrels in end structures of a mold, mounting tie rod spacers between end structures of the mold to accurately position and clamp the end structures of the mold, mounting bottom, sides, and top structures of a mold to the end structures to provide a rectangular box-shaped structure with the wound tubes enclosed therein, providing a high viscosity syntactic foam completely about said tubes and said tie rod spacers to fill said mold, curing the tubes and the high viscosity syntactic foam in the mold structure at room temperature for a predetermined number of hours, placing the mold structure in an oven at about 125° F. for several hours and then bringing the temperature up sufficient to cause complete curing of the tubes and the high viscosity syntactic foam and heating the structure at this predetermined temperature until cured, allowing the cured structure to cool down, removing the top, sides, bottom and end plates of the mold, and removing the mandrels and spacers from the cured structure to provide a composite launcher pod that has accurately aligned tubes thereof from which rockets can be launched.

4,556,439

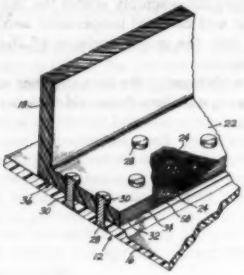
METHOD OF SEALING AND BONDING LAMINATED EPOXY PLATES

Engbert T. Bannink, Jr., Auburn, Wash., assignor to The Boeing Company, Seattle, Wash.

Continuation of Ser. No. 420,737, Sep. 21, 1982, abandoned, which is a division of Ser. No. 305,446, Sep. 25, 1981. This application Dec. 12, 1983, Ser. No. 560,742

Int. Cl.⁴ B32B *7/08, 31/00*

U.S. Cl. 156—92 **17 Claims**



1. A method of securing composite overlapping, laminated reinforced epoxy plates at their faying surfaces and of sealing and bonding the faying surfaces for use in an aircraft, said method comprising:

mixing an uncured resin with carbon microspheres;

impregnating a layer of spaced fibers with said mixture;

positioning the impregnated fibers between faying surfaces of overlapping laminated plates to form a thin bonding and sealing joint and to form a continuous electrically conductive contact path with the microspheres through the joint;

said plates being adapted to form aircraft wall structures and being formed having layers impregnated with epoxy to form a lamination along each layer;

securing the plates together at the faying surfaces with fastening means; and

curing the uncured resin to bond and seal the faying surfaces together to form a thin sealing bondline in the joint, the microspheres being in sufficient quantity to weaken the seal so as to permit the laminated plates to be wedged apart at the bondline when the fastening means are removed and so that damage from the wedging is limited to the bondline within the joint.

4,556,440

METHOD AND APPARATUS FOR PRODUCTION OF BIAS FABRICS

Ronald G. Krueger, Sparks, Nev., assignor to JB Group, Inc., Greenwich, Conn.

Filed Apr. 23, 1984, Ser. No. 603,096

Int. Cl.⁴ D04H *3/00;* **B32B** *5/00*

U.S. Cl. 156—181 **18 Claims**

1. A method for forming a bias-laid, non-woven fabric employing a pair of movable, parallel conveyors, said conveyors lying parallel to the long axis of the fabric being formed, and at the extremities of the short axis, each of said conveyors being provided with a series of needles, said needles being aimed away from the fabric being formed, comprising:

a. providing at least two yarn carriers which lay a plurality of yarns, the yarns from each carrier lying parallel to each other, from a first conveyor to a second conveyor and, subsequently, from said second conveyor to said first conveyor, the yarns from the second carrier lying at a predetermined angle to those from the first carrier;

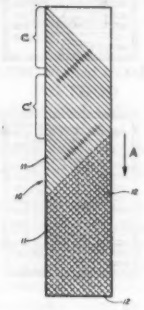
b. providing means to horizontally depress said yarn carrier at a point outside of each said conveyor whereby to wrap said yarns about said needles or impale said yarns on said needles:

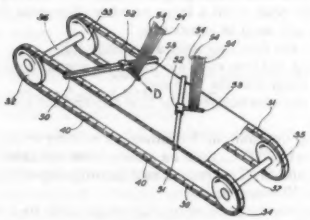
c. providing a first driving means for said conveyors: and

d. providing a second driving means for said yarn carriers, said second driving means providing for a reduction in the speed of movement of said yarn carriers at the extremities of travel.

9. An apparatus for forming a bias-laid non-woven fabric including:

a. a pair of parallel conveyors, said conveyors being parallel to the long axis of a bias-laid non-woven fabric to be formed, and lying at the extremities of the short axis of said fabric, said conveyors being provided with a plurality of equally spaced needles, said needles facing away from said fabric to be formed:





b. at least two yarn carriers, each said carrier having a plurality of openings, each said opening being provided so as to accommodate a single yarn to be laid in the traversing of said yarn carrier from one conveyor to the other conveyor, the mounting for said yarn carrier providing for travel of said yarn carrier to a point beyond the needles formed on said conveyors:

c. first means to drive said conveyor mechanisms;

d. second means to drive said yarn carriers, said second driving means reducing the rate of travel of said yarn carrier at the extremity of travel; and

e. means for bonding the formed, bias-laid, non-woven fabric.

4,556,441

PHARMACEUTICAL PACKAGING METHOD

Adrian L. Faasse, Jr., 4908 Stauffer Ave., SE., Kentwood, Mich. 49508

Filed Jan. 24, 1983, Ser. No. 460,582

Int. Cl.⁴ B32B *31/00, 31/18*

U.S. Cl. 156—247 **29 Claims**

1. A method for making base assemblies for medicine dispensing compresses and the like, comprising:

providing a web of substantially imperforate material, and a web of backing material, said backing material having a

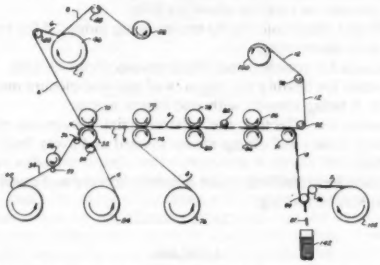
base layer with one adhesive side, and a cover layer normally overlying the adhesive side of the base layer;

separating the cover layer from the base layer of the backing material;

cutting a plurality of individual dam patches from the web of imperforate material, said dam patches each having a preselected shape, interior and exterior surfaces, and a marginal edge;

applying the dam patches to the adhesive side of the base layer in a preselected pattern, with the interior surfaces of the dam patches oriented outwardly;

applying the cover layer to the remaining exposed portion of the adhesive side of the base layer, such that the dam patches are sandwiched between the base layer and the cover layer;



cutting a plurality of individual base units in the base layer, with one of the dam patches positioned within each of the base units, that portion of the base layer disposed outside of the base units defining an offal portion of the base layer;

cutting a plurality of apertures in the cover layer to selectively access a portion of the interior surface of each of the dam patches, said apertures being located at each of those areas of the cover layer overlying the dam patches, and being positioned wholly within the marginal edge of the associated adjacent dam patch to facilitate centering medicine-filled pads on the interior surface of the dam patches; and

removing the offal portion of the base layer from the cover layer, thereby forming a plurality of fabricated base assemblies for the compresses, which are carried together on the cover layer for final assembly.

4,556,442

HAND-HELD ELECTRICALLY SELECTABLE LABELER

Daniel J. Torbeck, Dayton, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

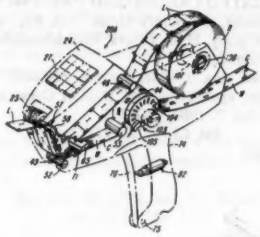
Continuation of Ser. No. 268,590, May 29, 1981, Pat. No. 4,407,692. This application Jul. 13, 1983, Ser. No. 513,217

The portion of the term of this patent subsequent to Oct. 4, 2000, has been disclaimed.

Int. Cl.[4] B41F *1/08*; B41J *3/00*

U.S. Cl. 156—350 **32 Claims**

1. A hand-held labelling machine comprising; a housing having a manually engageable handle, the housing having means for holding a label supply roll of a composite web having labels releasably adhered to a backing strip, means for printing on a label at a printing position, means for peeling the printed label from the backing strip, label applying means disposed adjacent the peeling means, means for advancing the web to peel a printed label from the backing strip at the peeling means and advance the printed label into label applying relationship with the label applying means and to advance another label into the printing position, means for entering selected data to be printed, means responsive to the data entering means for storing the selected data, means for storing data defining a print format, the printing means including a thermographic print head having a plurality of individually selectable print elements for printing on a thermographic label at the printing position, means coupled to said data storing means for electrically processing the selected data and energizing the individual print elements in a predetermined sequence determined by the selected data to print data on the label, wherein said advancing means includes signalling means electrically coupled to said



processing means for providing a signal representative of the position of a label relative to the print head, said processing means being responsive to said position representative signal and to said format defining data for rendering said print head operative to print the selected data on printable fields of the label defined by the format defining means.

4,556,443

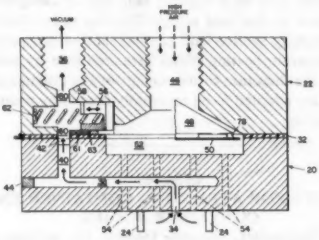
AIR SHUTTLE LABEL DISPENSER

Edward J. Moya, San Gabriel, Calif., assignor to Avery International Corporation, Pasadena, Calif.

Filed Mar. 11, 1983, Ser. No. 474,715

Int. Cl.[4] B65C *9/28*; B32B *31/00*; B44C *1/00*; F16K *31/143*

U.S. Cl. 156—356 **19 Claims**



19. A system for high speed application of labels to products comprising:

an apertured label receiving head, one face of said head including a plurality of vacuum ports or apertures, and a larger plurality of high pressure air blower ports or apertures;

first, vacuum conduit means for drawing air from said vacuum apertures to hold a label on said head, said vacuum conduit means being of relatively small cross-sectional area comparable to the area of said vacuum ports;

shuttle valve means in said head for directly shutting off said vacuum conduit means;

means for normally biasing said shuttle valve means to an open state;

second, high pressure air conduit means for supplying periodic pulses of high pressure air to said high pressure air ports or apertures; and

means for directly actuating said shuttle valve means by said high pressure air pulses to shut off said vacuum conduit means in response to said pulses of high pressure air from said second conduit means;

whereby said labels are released from vacuum restraining

forces concurrently with arrival of a blast of air from said blower parts or apertures to blow the labels away from said face of said head at high speed.

4,556,444

HEATING DEVICE FOR CORRUGATED CARDBOARD IN A CORRUGATED CARDBOARD PASTING MACHINE

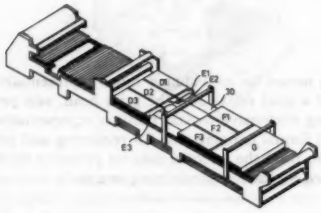
Manfred Schommler, Quickborn-Heide, Fed. Rep. of Germany, assignor to Werner H.K. Peters Maschinenfabrik GmbH, Fed. Rep. of Germany

Filed Aug. 9, 1984, Ser. No. 639,683

Claims priority, application Fed. Rep. of Germany, Aug. 19, 1983, 3329928; Jan. 7, 1984, 3400333

Int. Cl.⁴ B32B *31/12*

U.S. Cl. 156—359 **17 Claims**



1. A heating device for corrugated cardboard pasting machines comprising several heating plates spaced in the feeding direction and covering the maximum width of the corrugated cardboard strip, said heating plates being connectible to a source of heat via a control device with the corrugated cardboard being guided against the upward facing heating surface thereof under load by a loading belt and/or compressed air, characterized in that said several heating plates comprise at least one heating section said heating section comprising two or more separate heating plates arranged side by side transversely of the direction of movement of the corrugated cardboard and are adapted to be separately heated by means of the control device.

4,556,445

APPARATUS FOR ATTACHING CONTAINER ENDS TO CONTAINER BODIES

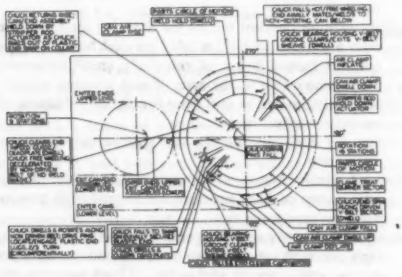
Dennis J. McCormick, Glendale Heights, Ill., assignor to Vercon, Inc., Dallas, Tex.

Filed Jun. 23, 1982, Ser. No. 391,116

The portion of the term of this patent subsequent to Mar. 8, 2002, has been disclaimed.

Int. Cl.⁴ B29C *27/08*

U.S. Cl. 156—423 **27 Claims**



1. In a continuous motion apparatus for attaching to one end of a cylindrical body member, a preformed, round end closure member, having a plastic rim area, the combination of:

(a) a base;

(b) a center column assembly mounted on said base and extending upwardly therefrom;

(c) a turret assembly mounted on said base and adapted to revolve about said center column assembly;

(d) means for revolving said turret assembly about said center column assembly;

(e) said turret assembly including a plurality of sets of tooling for attaching said end closure members to said body members;

(f) each of said sets of tooling including:

(i) chuck means for grasping one of said closure members to accommodate its rotation about its axis;

(ii) clamp means for grasping one of said body members to prevent its rotation about its axis;

(iii) said chuck and clamp means being mounted for relative axial movement;

(g) means for rotating said chuck means about its axis;

(h) means for heating the rim area of said end closure member, as it is being rotated with said chuck means;

(i) means for effecting the relative axial movement of said chuck means and clamp means toward and away from each other;

(j) means for transferring said members toward and away from said sets of tooling.

4,556,446

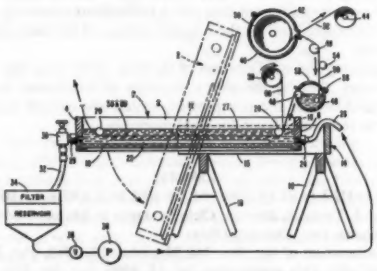
PROCESS AND APPARATUS FOR FORMING A WINDOW PANEL HAVING AN ENERGY CONTROL FILM LAMINATE

Herbert Yudenfriend, 5065 Wynnefield Ave., Philadelphia, Pa. 19131

Division of Ser. No. 397,771, Jul. 13, 1982, Pat. No. 4,489,134. This application Sep. 7, 1984, Ser. No. 648,254

Int. Cl.⁴ B32B *31/04*

U.S. Cl. 156—551 **6 Claims**



1. An apparatus for applying a sheet of energy control film to the surface of a window panel, said energy control film comprising an adhesive stratum adapted to contact and cause said film to adhere to said panel, comprising:

a receptacle means containing a bath of filtered demineralized water for supporting said window panel below the surface of said water;

film guiding means for guiding said sheet of energy control film through said demineralized filtered water bath in a direction generally parallel to said panel;

a protective layer guiding means for guiding and superposing a removable protective layer upon said energy control film sheet while submerged within said demineralized filtered water bath; and,

squeegeeing means for pressing said energy control sheet into intimate contact with said window panel, while submerged in said bath, and squeegeeing across the exposed surface of said removable protective layer.

4,556,447

ADHESIVE APPLICATORS

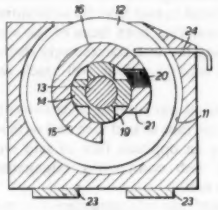
Albert J. Bradley, 3 Coach House, Saltford Ct., Saltford, Bristol, and Barrie D. Lake, Sherbourne Cottage, Redlands La., Bishop Sutton, Bristol, both of England

Filed Apr. 17, 1984, Ser. No. 601,336

Claims priority, application United Kingdom, Apr. 21, 1983, 8310856

Int. Cl.⁴ B65C *11/04*

U.S. Cl. 156—578 **14 Claims**



1. An adhesive supply unit comprising a supply tank having a top lip and an interior base, a valve positioned within the supply tank, the valve comprising a housing defining an inlet for connection to an adhesive reservoir, for the supply of adhesive under pressure, the valve also incorporating an outlet above the base of the interior of the supply tank, the top of the outlet from the housing being situated below the lip of the interior of the supply tank, and a feed member movable within the housing, the feed member defining at least one pocket in the form of a recess in the feed member which will be aligned initially only with the inlet to receive a charge of adhesive and subsequently will be aligned, upon movement of the feed member, only with the outlet from the housing so as to be able to deposit the charge of adhesive into the supply tank, if the level of adhesive has fallen below the level of the top of the outlet, the charge of adhesive otherwise being carried back in the pocket to the inlet upon further movement of the feed member.

4,556,448

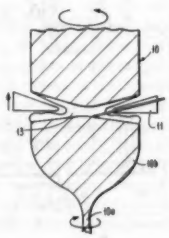
METHOD FOR CONTROLLED DOPING OF SILICON CRYSTALS BY IMPROVED FLOAT ZONE TECHNIQUE

Kyong M. Kim, Hopewell Junction; Pavel Smetana, Poughkeepsie, both of N.Y., and Gunther H. Schwuttke, Scottsdale, Ariz., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 19, 1983, Ser. No. 543,642

Int. Cl.⁴ C30B *13/10*

U.S. Cl. 156—605 **6 Claims**



1. A method for controlling the incorporation of doping material into a semiconductor crystal, comprising the steps of:

supporting and rotating a rod of polycrystalline semiconductor material;

providing an inductive heating coil surrounding the rod;

energizing the coil to locally melt the rod while concurrently moving the coil and rod relative to each other to create a floating zone of molten semiconductor material; and

moving a solid doping rod containing fused silica into said zone and toward the center of the first-mentioned rod to dope the first-mentioned rod with oxygen in a controlled manner according to the composition and cross-section of the doping rod and the rate at which it is moved into the zone, thereby to convert the polycrystalline semiconductor material to a monocrystalline semiconductor material having an accurately controlled selectable oxygen concentration.

4,556,449

NICKEL ETCHING PROCESS AND SOLUTION

Norvell J. Nelson, Palo Alto, Calif., assignor to PSI Star, Hayward, Calif.

Filed Oct. 15, 1984, Ser. No. 661,143

Int. Cl.⁴ C23F *1/02*

U.S. Cl. 156—659.1 **17 Claims**

1. In a process for etching nickel or a nickel alloy: contacting the nickel or alloy with a solution containing nitric acid, nickel nitrate, a halogen additive and a surfactant.

4,556,450

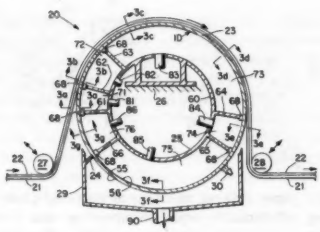
METHOD OF AND APPARATUS FOR REMOVING LIQUID FOR WEBS OF POROUS MATERIAL

Strong C. Chuang, Cincinnati, and Hugh A. Thompson, Fairfield, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Dec. 30, 1982, Ser. No. 454,808

Int. Cl.⁴ D21F *5/02*

U.S. Cl. 162—204 **16 Claims**



1. A method of removing liquid from a continuous wet porous web on the run without inducing substantial compaction of the web, said method comprising the steps of:

looping the running web directly onto and about a rotatably mounted cylinder so that said web wraps only a predetermined first sector of said cylinder, said cylinder having a porous shell wherein the pores are preferential-capillary-size which are effectively smaller than the pores of said web whereby some of said liquid is capillarily transferred from said web into said pores of said porous shell;

drawing vacuum within said first sector of said cylinder immediately subjacent said porous shell to precipitate a sufficient pneumatic pressure differential across said web and said shell to pneumatically augment capillary transfer of liquid from said web into said cylinder via said pores in said porous shell as said web traverses said sector;

leading said web from said cylinder at the downstream end of said sector; and

pneumatically outwardly expelling said liquid from another sector of said shell which is not covered by said web.

10. An apparatus for removing liquid from a running wet porous web without inducing substantial compaction of the running web, said apparatus comprising:

a rotatably mounted capillary cylinder having a porous shell

having preferential-capillary-size pores which are effectively smaller than the pores of the running web;

means for rotating said porous shell about the axis of said cylinder;

substantially non-compressive means for leading the running web onto and off of said cylinder so that the running web wraps a predetermined sector of said cylinder and is in direct contact with the portion of said porous shell spanning said sector;

stationary cylinder compartmenting means for applying a predetermined level of vacuum within said sector subjacent said porous shell to augment capillary transfer of said liquid from the running web into said cylinder; and

means for removing from said cylinder sufficient liquid which is transferred from the running web into said cylinder as the running web traverses said wrapped sector thereof to enable continuous such transfer of liquid from the running web into said cylinder as it rotates, said means for removing said liquid comprising pneumatic means for expelling said liquid outwardly from said pores of said porous shell which are not covered by the web.

4,556,451

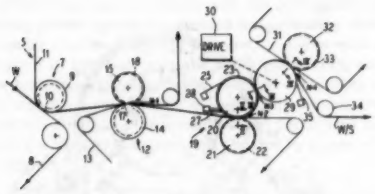
METHOD OF AND APPARATUS FOR SUBSTANTIALLY EQUAL COMPACTING AND DEWATERING OF BOTH FACES OF FRESHLY FELTED PAPER WEB

Donald A. Ely, Roscoe, Ill., assignor to Beloit Corporation, Beloit, Wis.

Continuation of Ser. No. 393,909, Jun. 30, 1982, abandoned, which is a continuation of Ser. No. 217,657, Dec. 18, 1980, abandoned. This application Aug. 22, 1984, Ser. No. 644,132

Int. Cl.⁴ D21F *3/04, 3/08, 3/10*

U.S. Cl. 162—205 **14 Claims**



1. In a paper making machine dewatering press section for effecting substantially equal compacting and dewatering of both faces of a freshly felted paper sheet web without an open paper draw:

first press roll means providing a double action dewatering first nip through which the web passes in engagement between corunning porous dewatering felts, so that both faces of the web are substantially equally pressed and dewatered in said first nip;

second press roll means comprising a four roll stack including a first porous roll and a first non-porous roll forming a second nip, a second non-porous roll forming a third nip with said first non-porous roll, said second non-porous roll having a surface hardness greater than the surface hardness of said first non-porous roll, and a second porous roll forming a fourth nip with said second non-porous roll through which said web runs successively;

a dewatering felt running in engagement with one face of said web and said first porous roll through said second nip, and the opposite face of said web being in direct non-dewatering compacting engagement with said first non-porous roll in said second nip;

both faces of said web being in respective direct non-dewatering compacting engagement with said first and second non-porous rolls in said third nip;

and a dewatering felt running in engagement with said opposite face of said web and said second porous roll in said fourth nip and said one face of said web being in direct non-dewatering compacting engagement with said second non-porous roll in said fourth nip;

so that said web leaves said press section as a paper sheet having both faces substantially equally multiply compacted and dewatered.

8. A method of effecting, in a paper making machine dewatering press section, substantially equal compacting and dewatering of both faces of a freshly felted paper sheet web, comprising:

(a) pressing the web in engagement between corunning porous dewatering felts through a double action dewatering first nip and in said first nip substantially equally pressing and dewatering both faces of the web;

(b) then running the web successively through second, third and fourth nips in a four roll stack second press, and including:

(c) in said second nip running a dewatering felt in engagement with one face of said web and with a first porous roll, and running an opposite face of said web in direct non-dewatering web compacting engagement with a first non-porous roll;

(d) in said third nip effecting direct non-dewatering web compacting engagement of both faces of the web by running said web between said first non-porous roll and a second non-porous roll having a surface hardness greater than the surface hardness of said first non-porous roll;

(e) and in said fourth nip running another dewatering felt in engagement with said opposite face of the web and a second dewatering roll while running said one face of the web in direct non-dewatering web compacting engagement with said second non-porous roll;

so that said web leaves said press section as a paper sheet having both faces substantially equally compacted and dewatered and thereby possessed of substantially equal ink, size and coating receptivity or absorption characteristics.

4,556,452

PROCESS AND APPARATUS FOR PRODUCING PULP

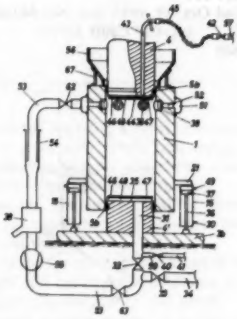
Augustin Raggam, St. Margarethen, and Hermann Rabitsch, Vienna, both of Austria, assignors to Simmering-Graz-Pauker Aktiengesellschaft, Vienna, Austria

Division of Ser. No. 322,232, Nov. 17, 1981, Pat. No. 4,451,331. This application Mar. 16, 1984, Ser. No. 590,475

Claims priority, application Austria, Nov. 20, 1980, 5680/80; Oct. 27, 1981, 4564/81

Int. Cl.⁴ D21C *7/00*

U.S. Cl. 162—233 **16 Claims**



1. A compacting apparatus for producing pulp from impregnated, cellulose-containing starting materials, comprising a shell having an interior and a pair of ends, which shell contains on one end thereof a piston having an inner end face and on the other end thereof a shutting means having an inner end face, the interior of the shell and the confronting end faces of the

piston and the shutting means defining a compacting chamber which contains the material to be compacted, perforated means associated with at least one of the shutting means, the shell and the piston for supplying and discharging processing fluids to and from the compacting chamber, wherein at least the piston and the shutting means are movable relative to each other, and the shell is movable relative to the piston and the shutting means, and a heating means for heating the material in the compacting chamber.

4,556,453

APPARATUS FOR CLEANING PAPER MAKING MACHINE SCREEN BELTS

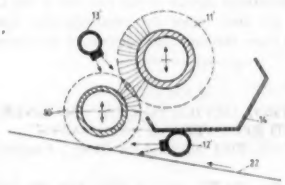
Albrecht Meinecke, Heidenheim, Fed. Rep. of Germany, assignor to J. M. Voith GmbH, Heidenheim, Fed. Rep. of Germany

Filed Jul. 26, 1984, Ser. No. 634,555

Claims priority, application Fed. Rep. of Germany, Aug. 6, 1983, 3328515

Int. Cl.⁴ D21F *1/32, 7/00*

U.S. Cl. 162—274 **13 Claims**



1. Apparatus for cleaning a paper making machine screen belt, comprising first rotary brush means having an axis of rotation transverse to the direction of travel of said screen belt, said first rotary brush means comprising generally outwardly radiating bristles, said bristles of said first rotary brush means operatively engaging said screen belt as to during rotation of said first rotary brush means and travel of said screen belt remove impurities carried by said screen belt, and scraping means spaced from said screen belt and operatively engaging said bristles of said first rotary brush means, said scraping means being effective to scrape from said first rotary brush means such of said impurities as are carried by said bristles of said first rotary brush means as a consequence of said first rotary brush means removing said impurities from said screen belt and thereafter depositing said impurities as are scraped from said bristles of said first rotary brush means into a receiving area other than said screen belt, said scraping means comprising second rotary brush means, wherein said second rotary brush means comprises generally outwardly radiating bristles, wherein said outwardly radiating bristles of said second rotary brush means operatively engage the outwardly radiating bristles of said first rotary brush means, wherein said bristles of said first rotary brush means are comprised of material having an affinity for said impurities carried by said screen belt, and wherein said bristles of said second rotary brush means are comprised of material having an affinity for said impurities which is less than the affinity of said bristles of said first rotary brush means.

4,556,454

WET PRESS FOR DEWATERING A WEB OF MATERIAL

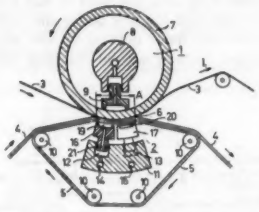
Hans Dahl; Herbert Holik, both of Ravensburg; Rüdiger Kurtz, Immenstaad, and Wolf-Gunter Stotz, Ravensburg, all of Fed. Rep. of Germany, assignors to Sulzer-Escher Wyss GmbH, Ravensburg, Fed. Rep. of Germany

Filed Jan. 28, 1985, Ser. No. 695,853

Claims priority, application Switzerland, Feb. 6, 1984, 533/84

Int. Cl.⁴ D21F *3/02*

U.S. Cl. 162—358 **12 Claims**



1. A wet press for dewatering a web of material, comprising:

a rotating roll having a circumference;

a contact pressure device;

said contact pressure device and said rotating roll defining therebetween a press nip;

at least one water-absorbent belt;

the web of material being guided conjointly with said at least one water-absorbent belt between said contact pressure device and said rotating roll through said press nip and along a portion of said circumference of said rotating roll;

the web of material having a predetermined direction of travel;

said contact device comprising at least two substantially transverse rows of contact pressure elements arranged sequentially in said predetermined direction of travel; and

a plurality of said contact pressure elements in each row being arranged in adjacent relationship in a direction substantially transverse to said predetermined direction of travel such that said contact pressure elements of one row of said at least two rows are transversely shifted in relation to said contact pressure elements of at least one further row of said at least two rows.

4,556,455

METHOD OF CHARGING DRY COKE COOLING PIT USING SLUICE

Heinrich Weber, Recklinghausen; Kurt Lorenz, Hattingen; Horst Dungs, Herne; Engelbert Bruns, Recklinghausen, and Gerd Osterholt, Dorsten, all of Fed. Rep. of Germany, assignors to Firma Carl Still GmbH & Co. KG, Fed. Rep. of Germany

Division of Ser. No. 458,269, Jan. 17, 1983, Pat. No. 4,508,596. This application Feb. 16, 1984, Ser. No. 580,696

Int. Cl.⁴ C10B *57/00*

U.S. Cl. 201—39 **1 Claim**

1. A method for charging hot coke from a coke hopper having a housing cover into a coke cooling pit having a top charging opening with a housing bottom therearound spaced from said housing cover for dry cooling the coke, and using a sluicing housing frame with side walls extending from said housing cover to said housing bottom and enclosing an interior space between said hopper and said cooling pit, said sluicing housing frame carrying in said space a vertically movable closing member for closing the pit charging opening and a transition connecting piece bridging the space between said hopper and said pit charging opening, said closing member being offset from said transition connecting piece in a direction of movement of said sluicing housing frame, comprising:

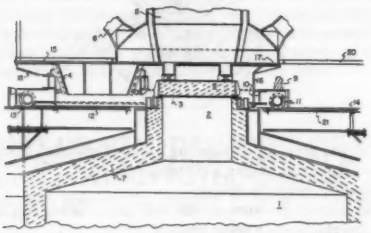
transferring hot coke to the hopper with the closing member in position closing the pit charging opening;

positioning the hopper over the charging opening;

raising the closing member from the pit charging opening;

exhausting gases from the interior of the space defined by said sluicing housing frame;

moving said sluicing housing frame with said closing member and said transition connecting piece therein, laterally to move said closing member away from said pit charging opening and for positioning said transition connecting piece between said hopper and said pit charging opening while maintaining said side wall of said sluicing housing frame between said housing cover and said housing bottom so that said space defined by said sluicing housing frame always contains said pit charging opening;



releasing hot coke from said hopper through said transition connecting piece into said cooling pit through said pit charging opening;

after all the hot coke has been released from said hopper into said cooling pit, moving said sluicing housing frame laterally back to a position with said closing member over said pit charging opening and said transition connecting piece spaced laterally from said pit charging opening;

lowering said closing member onto said pit charging opening to close said pit charging opening; and

continuing the exhaust of gas from the space defined by said sluicing housing frame while said sluicing housing frame is moved and while coke is released from said hopper into said cooling pit, and until said closing member is replaced onto said pit charging opening to again close said pit charging opening.

4,556,456

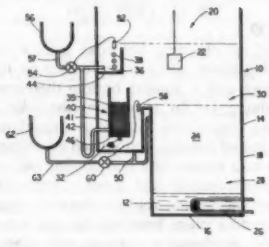
MULTI-VAPOR LEVEL VAPOR GENERATING AND RECOVERY APPARATUS

Michael J. Ruckriegel, 410 Westwood Dr., Middletown, Ky. 40243, and James W. McCord, 9101 Nottingham Parkway, Louisville, Ky. 40222

Filed Feb. 21, 1984, Ser. No. 581,543

Int. Cl.[4] B01D *3/42*

U.S. Cl. 202—186 **11 Claims**



1. An apparatus for vaporizing and recovering a fluid mixture containing at least a first liquid and a second liquid having different vaporizing temperatures, comprising:

a housing defining at least one chamber open to the atmosphere for containing the fluid mixture in its liquid and vapor form;

heating means located proximate the lower region of the housing for vaporizing the fluid mixture thereby providing a first vapor zone and a second vapor zone overlaying the first vapor zone;

vapor condensing menas operating at a temperature less than the vaporizing temperature of the second liquid, said vapor condensing means being located at least partially below the upper surface of the second vapor zone;

condensate collection means located to collect condensate condensed by the vapor condensing means;

a separation device for separating first liquid condensed with the second liquid by the condensing means;

means for providing liquid condensate flow communication from the condensing means to the separation device externally of the first and second vapor zones;

vapor flow communication means providing for vapor flow communication with the portion of the chamber containing the first vapor zone and the portion of the chamber containing the second vapor zone such that the first vapor from the first vapor zone will pass to the separator device through said vapor flow communication means to transfer latent heat to the liquid condensate in the separator device thereby simultaneously vaporizing the second liquid component of the liquid condensate and condensing the first vapor, whereupon the second vapor returns to the second vapor zone through said vapor communication means; and,

liquid flow communication means providing liquid flow from said separator device to the portion of the chamber containing the first vapor for returning the first vapor condensate from the separator device to the chamber.

4,556,457

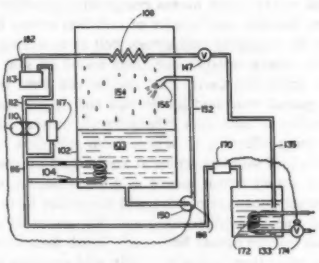
SAFETY CONTROL DEVICE FOR VAPOR GENERATING AND RECOVERING APPARATUS

James W. McCord, 9101 Nottingham Pkwy., Louisville, Ky. 40222

Division of Ser. No. 294,777, Aug. 8, 1981, Pat. No. 4,375,751. This application Dec. 27, 1982, Ser. No. 453,218

Int. Cl.[4] B01D *3/42*

U.S. Cl. 202—206 **3 Claims**



1. In A vapor generating and recovery apparatus for vaporizing a liquid in a liquid zone and condensing a vapor in a vapor zone above the liquid zone, including a housing having at least one compartment therein, said compartment having a liquid and a vapor therein, and a heating and cooling system to vaporize the liquid and condense the vapor, said system including a refrigerant compressor, a refrigerant condenser, expansion means, a refrigerant evaporator in heat exchange relation with the vapor, and a conduit means in flow communication with said condenser, said expansion means, and said evaporator, said

system further including a heat transfer fluid therein, the improvement comprising:

sensing means on the low pressure side of the heating and cooling system to monitor a physical characteristic of the heat transfer fluid flowing to the refrigerant compressor, said sensing means being in communication with said refrigerant compressor to deactivate said refrigerant compressor in response to preselected conditions of said heat transfer fluid which correspond to an unsafe vapor level in the compartment;

means to transfer liquid from said liquid zone of said compartment and means to spray liquid from the means to transfer liquid; and,

pump means operatively associated with said means to transfer liquid for moving liquid along said liquid transfer means from the liquid zone to said liquid spray means; and,

said sensing means being in operative electrical communication with said pump means to de-activate said pump means in response to preselected conditions of said heat transfer fluid which correspond to an unsafe vapor level in the compartment.

4,556,458

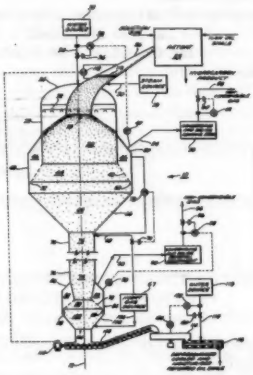
APPARATUS FOR COOLING, DEPRESSURIZING, AND MOISTURIZING RETORTED OIL SHALE

Roland F. Deering, Brea; John E. Hines, Costa Mesa, and Roland O. Dhondt, deceased, late of Long Beach, all of Calif. (by Ruth Dhondt, executor), assignors to Union Oil Company of California, Los Angeles, Calif.

Division of Ser. No. 400,723, Jul. 22, 1982, Pat. No. 4,461,673. This application Jun. 29, 1984, Ser. No. 604,053

Int. Cl.⁴ C10B *39/04, 45/00, 53/06*

U.S. Cl. 202—227 **11 Claims**



1. An apparatus for cooling and depressurizing retorted oil shale particles discharged from an oil shale retort operated at superatmospheric pressure, said apparatus comprising:

(a) a fluid-tight cooling chamber communicating with said retort such that a gravitating bed of said oil shale particles may flow from said retort into said cooling chamber;

(b) means for delivering a controlled flow of water to the upper portion of said cooling chamber;

(c) means for maintaining said cooling chamber at a pressure sufficient to prevent substantial gas flow between said cooling chamber and said retort;

(d) a fluid-tight gas disengaging chamber communicating with the bottom of said cooling chamber, said gas disengaging chamber comprising a downwardly diverging truncated cone containing means to withdraw gas from said gas disengaging chamber;

(e) a fluid-tight stripping chamber communicating with the bottom of said gas disengaging chamber, said stripping chamber comprising an upper cylindrical section and a lower section comprising a downwardly diverging truncated cone containing an outlet having a smaller diameter than the diameter of said upper cylindrical section;

(f) a fluid-tight seal leg chamber communicating with the bottom of said stripping chamber, said seal leg chamber comprising a cylindrical section having a length-to-cross sectional area ratio between about 4 and about 14 feet per square foot and an upper end having substantially the same diameter as the outlet of said stripping chamber and wherein said lenth-to-cross sectional area provides a substantial resistance to downwardly directed gas flow when said seal leg chamber contains a gravitating bed of retorted oil shale particles; and

(g) means for introducing an inert gas near the top of said seal leg chamber below the outlet of said stripping chamber.

4,556,459

SEALING ARRANGEMENT AT COKE OVEN CHAMBERS

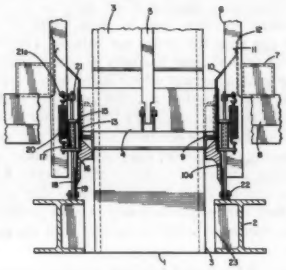
Engelbert Bruns, Recklinghausen, and August Lucas, Datteln-Horneburg, both of Fed. Rep. of Germany, assignors to Firma Carl Still GmbH & Co. KG, Fed. Rep. of Germany

Filed Apr. 23, 1984, Ser. No. 603,115

Claims priority, application Fed. Rep. of Germany, Apr. 23, 1983, 3314850

Int. Cl.⁴ C10B *27/04*

U.S. Cl. 202—263 **4 Claims**



1. In combination with a coke oven chamber having an opening bounded by side anchor posts and a top member, all having outer surfaces, and a coke guide having side frame sections and an upper cross member connected between said side frame section and defining an inner space communicating with said coke oven chamber opening, a sealing arrangement comprising:

a fixed slide sheet connected to each side frame section and to said upper cross member;

a plurality of side sealing sheets for each side frame section and an upper sealing sheet for said upper cross member, each sealing sheet having one leg extending parallel to said outer surface of said anchor posts and top member, and another leg connected to said one leg and slidably engaged against one of said slide sheets;

an actuating rod connected to each sealing sheet, each actuating rod having one end connected to its respective sealing sheet and an opposite end mounted for sliding motion to said coke guide for movement of a respective sealing sheet toward and away from said outer surfaces; and

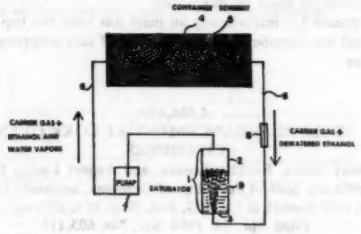
a separate tension spring connected between each actuating rod and said coke guide for biasing each sealing sheet against one of said outer surfaces, each tension spring being positioned outside of said inner space and at a loca-

tion spaced away from said outer surface and said sealing sheets.

4,556,460
DEHYDRATION OF ETHANOL

George H. Robertson, Berkeley, and Attila E. Pavlath, Walnut Creek, both of Calif., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Jun. 4, 1982, Ser. No. 385,161
Int. Cl.⁴ B01D *3/02, 53/04;* C07C *29/80*
U.S. Cl. 203—19 16 Claims



1. A process for dewatering an ethanol-water mixture, comprising:

(a) contacting an ethanol-water liquid solution with a carrier gas to vaporize a portion of the solution to form a carrier gas-treated solution, and at least partially saturate the carrier gas with the water and ethanol vapors;

(b) passing said at least partially saturated carrier gas into contact with a sorbent which sorbs water vapor in preference to ethanol vapor thereby resulting in a gas exiting from step (b) that contains a lower water to ethanol ratio than in said at least partially saturated gas; and

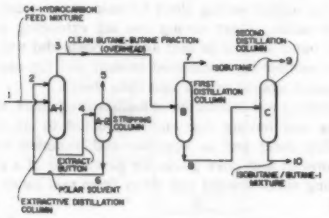
(c) contacting said carrier gas-treated solution with said gas containing said lower water to ethanol ratio by circulating said gas exiting from step (b) back to step (a);

wherein said carrier gas and said at least partially saturated gas are circulated without contact with the outside atmosphere.

4,556,461
PROCESS FOR SEPARATING HIGHLY PURE BUTENE-1 OR BUTENE-1/ISOBUTENE MIXTURE FROM C_4 HYDROCARBON FRACTION

Shunichiro Ogura, Tokyo, and Masamichi Soumai, Yokohama, both of Japan, assignors to Nippon Zeon Co., Ltd., Tokyo, Japan

Filed Dec. 1, 1982, Ser. No. 445,974
Claims priority, application Japan, Jan. 22, 1982, 57-8288
Int. Cl.⁴ C07C *7/08*
U.S. Cl. 203—29 6 Claims

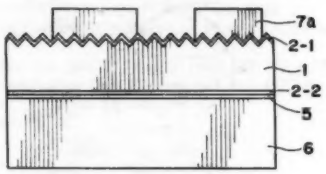


1. A process for separating a butene-1/isobutene mixture from a C_4 hydrocarbon fraction, which comprises subjecting the C_4 hydrocarbon fraction to extractive distillation using a polar solvent to separate components predominantly containing 1,3-butadiene as an extract bottom and obtain an overhead containing butanes, butene-1, isobutene and butene-2 as main components and being substantially free from C_3–C_4 diolefinic and acetylenic hydrocarbons, feeding the overhead into a first distillation column, removing isobutane as an overhead component from the first distillation column, feeding high-boiling components from the bottom of the first distillation column to a second distillation column, removing n-butane and butene-2 from the bottom of the second distillation column, and obtaining highly pure butene-1 and isobutene from its top.

4,556,462
METHOD FOR PRODUCING A LITHOGRAPHIC PRINTING PLATE

Kiyomi Sakurai, and Seiji Arimatsu, both of Neyagawa, Japan, assignors to Nippon Paint Co., Ltd., Osaka, Japan

Division of Ser. No. 454,554, Dec. 30, 1982, Pat. No. 4,480,549, which is a continuation of Ser. No. 244,648, Mar. 17, 1981, abandoned. This application Jul. 20, 1984, Ser. No. 632,856
Claims priority, application Japan, Mar. 17, 1980, 55-34641; Mar. 17, 1980, 55-34642
The portion of the term of this patent subsequent to Nov. 6, 2001, has been disclaimed.
Int. Cl.⁴ C25D *1/04, 1/20*
U.S. Cl. 204—6 6 Claims



1. A method for producing a lithographic printing plate which comprises:

(a) providing a support comprising an iron foil prepared by electroforming, wherein one surface of said foil is in contact with an electrolyte and the opposite surface is in contact with a negative electrode, said surface in contact with said electrolyte having a relatively rough surface compared to said surface in contact with said negative electrode and wherein the porosity of said surface in contact with said electrolyte is about 4–8.5μ, said foil being electroplated with a hydrophilic metal on both surfaces to form a hydrophilic metal layer sufficiently thin as to substantially retain the porosity of the iron foil, and

(b) providing an oleophilic image area formed from a photosensitive resin on said surface of the hydrophilic metal coated iron foil, which was in contact with said electrolyte and a non-image area where said resin is not present on said surface of said hydrophilic metal coated iron foil which was in contact with said electolyte,

said non-image area exhibiting good hydrophilic and water retentive properties in lithographic printing.

4,556,463
PROCESS FOR REMOVING SULPHATE FROM ELECTROLYSTS BRINE

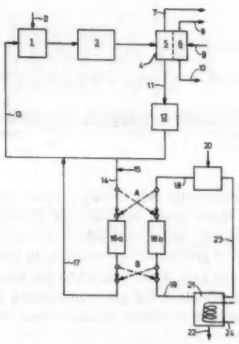
Franz-Rudolf Minz, Dormagen, and Sandor Vajna, Bonn, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Fed. Rep. of Germany

Filed Dec. 4, 1984, Ser. No. 678,095

Claims priority, application Fed. Rep. of Germany, Dec. 20, 1983, 3345898

Int. Cl.[4] C25B *1/16, 1/00;* **C02F** *1/46*

U.S. Cl. 204—98 **7 Claims**



1. In the continous process of electrolysis of alkali metal chloride brine containing sulfate ion impurities wherein the brine is added to an anode compartment of an electrolysis cell and a spent weak brine is removed therefrom, reconcentrated with alkali metal chloride and recycled to the cell, the improvement according to which comprises removing sulfate ion impurity from the spent weak brine by diluting the weak brine to an alkali metal chloride content of less than 150 grams per liter, passing the diluted weak brine through a weakly basic anion exchange medium to remove sulfate ions, and recycling the treated weak brine to the electrolysis cell after concentration with alkali metal chloride.

4,556,464
ENDBLOCK CROSSLINKED BLOCK COPOLYMER ADHESIVE COMPOSITION

David J. St. Clair, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Continuation-in-part of Ser. No. 481,595, Apr. 4, 1983, abandoned. This application Apr. 29, 1985, Ser. No. 728,002

Int. Cl.[4] C08J *3/28;* **C08L** *53/02*

U.S. Cl. 204—159.15 **11 Claims**

1. An adhesive composition prepared by curing

(a) 100 parts by weight of an ABA block copolymer wherein A is a random copolymer of a monoalkenylarene and a conjugated diene and has a glass transition temperature of from 19° C. to 100° C. and B is an elastomeric conjugated diene, wherein the weight percentage of the A blocks in the finished block polymer is between about 4 and about 55 percent;

(b) about 25 to about 200 parts by weight of a tackifying resin compatible with block B;

(c) 0 to about 25 parts by weight of a crosslinking agent preferentially compatible with block A; and

wherein said curing occurs between the monoalkenylarene-conjugated diene copolymer blocks.

2. The composition of claim 1 wherein said curing is radiation curing.

4,556,465
METHOD OF CONCENTRATING SILICA IN AN AQUEOUS ALKALI METAL SILICATE SOLUTION

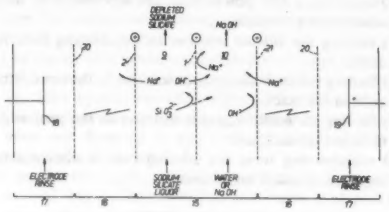
Graham W. Scott, Northwich, and James H. Steven, Runcorn, both of England, assignors to Imperial Industries plc, London, England

Filed Sep. 21, 1984, Ser. No. 653,045

Claims priority, application United Kingdom, Sep. 23, 1983, 8325477

Int. Cl.[4] C25B *7/00, 1/16*

U.S. Cl. 204—182.2 **8 Claims**



1. A method for increasing the ratio of silica to alkali in an aqueous solution of alkali metal silicate which method comprises:

(1) passing the aqueous silicate solution through an electrodialysis stack, the stack comprising alternating anion exchange membranes and cation exchange membranes which are mounted between electrodes and separated by spacers to form a plurality of cells through which a fluid can be caused to flow,

(2) applying a DC potential across the electrodes to provide an anode and a cathode,

(3) feeding the silicate solution to alternate cells in the stack having their anion exchange membrane on the anode side,

(4) feeding water or an aqueous solution to the other cells in the stack, and

(5) withdrawing from the stack a silicate solution depleted of alkali metal ions and an aqueous solution enriched in alkali metal ions.

4,556,466
METHOD OF CONCENTRATING SILICA IN AN AQUEOUS ALKALI METAL SILICATE SOLUTION

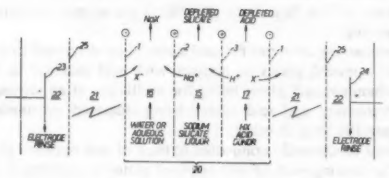
Graham W. Scott, Northwich, and James H. Steven, Runcorn, both of England, assignors to Imperial Chemical Industries plc, London, England

Filed Sep. 21, 1984, Ser. No. 653,046

Claims priority, application United Kingdom, Sep. 23, 1983, 8325478

Int. Cl.[4] C25B *7/00, 1/16*

U.S. Cl. 204—182.2 **8 Claims**



1. A method for increasing the ratio of silica to alkali in an aqueous solution of alkali metal silicate which method comprises:

(1) passing the aqueous silicate solution through an electrodialysis stack, the stack comprising ion exchange membranes mounted between electrodes and separated by

spacers to form a plurality of cells through which a fluid can be caused to flow, the membranes being arranged in triplets of an anion-exchange membrane, a first cation-exchange membrane and a second cation-exchange membrane to form cell triplets comprising a concentration cell between the anion-exchange membrane and the first cation-exchange membrane, a diluting cell between the first and second cation-exchange membranes and a proton donor cell between the second cation-exchange membrane and the anion-exchange membrane of the adjacent membrane triplet,

(2) applying a DC potential to the electrodes to form an anode and a cathode,

(3) feeding the silicate solution to the diluting cells in the stack,

(4) feeding water or an aqueous solution to the concentrating cells in the stack,

(5) feeding an acidic aqueous solution to the proton donor cells in the stack, and

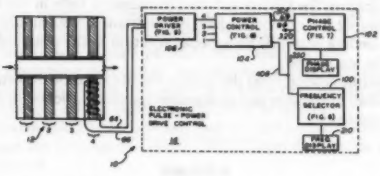
(6) withdrawing from the diluting cells a silicate solution depleted of alkali metal ions.

4,556,467

APPARATUS FOR ULTRASONIC PROCESSING OF MATERIALS

Martin C. Kuhn, Tucson, Ariz., and Vernon Zeitz, Springfield, Vt., assignors to Mineral Separation Corporation, Tucson, Ariz.

Filed Jun. 22, 1981, Ser. No. 275,988
Int. Cl.⁴ B01J *19/10;* **B02C** *19/18;* **B08B** *3/12;* **C22B** *1/00*
U.S. Cl. 204—193 **17 Claims**



1. An apparatus for treating material with waves having an ultrasonic frequency having a minimum frequency of at least one thousand (1,000) cycles per second (c.p.s.) and a power intensity of less than forty (40) watts per square centimeter, comprising:

a processing chamber for said material to be treated therein;

two opposed plates in contact with said material in said chamber, said plates being for oscillation at an ultrasonic frequency and said plates being disposed substantially parallel to each other;

means functionally connected to each of said opposed plates for causing each of said opposed plates to oscillate at said frequency;

means functionally connected to each to said opposed plates for varying the relative phase relationship between each of said opposed paltes; and

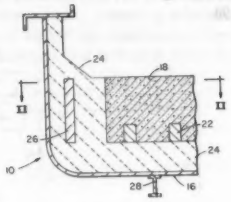
means functionally connected to each of said opposed plates for causing each of said opposed plates to oscillate at an amplitude.

4,556,468

ELECTROLYTIC CELL

Richard W. Peterson, and Richard L. Rolf, both of New Kensington, Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Sep. 26, 1984, Ser. No. 654,420
Int. Cl.⁴ C25C *3/00, 7/00*
U.S. Cl. 204—243 R **4 Claims**



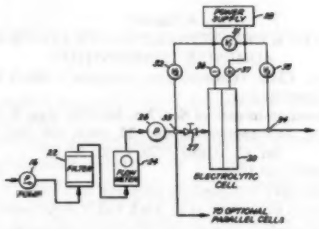
1. In an electrolytic cell having a floor, a boundary for the floor, and a metal shell surrounding the boundary, the cell having a short side and a long side, the improvement comprising a material of greater compressibility in the boundary on the short side of the cell, as compared to the long side of the cell, in an amount effective for accommodating longitudinally directed expansion of the floor, to counteract longitudinal cracking of the floor.

4,556,469

ELECTROLYTIC REACTOR FOR CLEANING WASTEWATER

Bang M. Kim, and Joseph L. Weininger, both of Schenectady, N.Y., assignors to General Electric Environmental Services, Inc., Lebanon, Pa.

Division of Ser. No. 320,252, Nov. 12, 1981, Pat. No. 4,445,990. This application Jan. 23, 1984, Ser. No. 572,797
Int. Cl.⁴ C25B *9/00, 11/03, 11/04, 11/12*
U.S. Cl. 204—263 **8 Claims**



1. An apparatus for treating metal plating operation wastewater, particularly for removal of metal and breakdown of toxic organics, chelating agents and cyanide, said apparatus comprising:

a cathode comprising a felt mass of conductive fibers;

a flow-through anode comprising electrically conductive multivalent metal oxides;

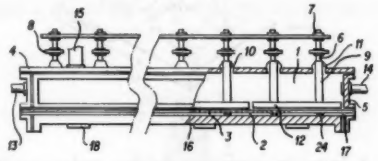
a nonconductive separator disposed between said cathode and said anode; and

a housing having said anode, cathode and separator disposed therein and defining a fluid flowpath through said cathode, said separator and said anode, respectively.

4,556,470
ELECTROLYTIC CELL WITH MEMBRANE AND SOLID, HORIZONTAL CATHODE PLATE

Yasushi Samejima, Kakogawa; Minoru Shiga, Himeji; Toshiji Kano, Kakogawa, and Kiyoshi Yamada, Kobe, all of Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Apr. 11, 1984, Ser. No. 599,135
Claims priority, application Japan, Apr. 16, 1983, 58-67419
Int. Cl.[4] C25B *1/46*
U.S. Cl. 204—266 9 Claims



1. An electrolytic cell comprising an upper anode compartment and a lower cathode compartment, said compartments being partitioned by a cation exchange membrane positioned substantially horizontally,

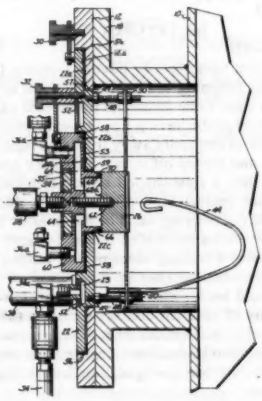
said anode compartment having therein substantially horizontal anode plates and being surrounded by a top cover, side walls positioned so as to enclose the anodes and the upper side of the membrane, and being provided with at least one inlet of anolyte solution and at least one outlet of anolyte solution and/or anode gas, and

said cathode compartment being surrounded by a solid and substantially imperforate cathode plate on which one or more partitioning spacers are arranged at a suitable interval, side walls so as to enclose the cathode plate and the underside of the membrane, and being provided with at least one inlet of catholyte liquor and at least one outlet of a mixed stream of cathode gas and catholyte liquor.

4,556,471
PHYSICAL VAPOR DEPOSITION APPARATUS

Clark Bergman, Roseville; Gary E. Vergason, Minneapolis, both of Minn.; William Allen, River Falls, Wis., and Michael F. Reed, Coon Rapids, Minn., assignors to Multi-Arc Vacuum Systems Inc., St. Paul, Minn.

Filed Oct. 14, 1983, Ser. No. 542,120
Int. Cl.[4] C23C *13/12*
U.S. Cl. 204—298 21 Claims



1. A consumable electrode mounting assembly for a physical vapor deposition machine of the type having a chamber wall defining an internal deposition chamber, comprising:

(a) an outer portion operatively connected to the chamber wall and disposed about a longitudinal axis and having a first surface forming an angle alpha with said longitudinal axis and a second surface adjacent to said first surface and forming an angle beta therewith, said angle beta being an angle other than 0°;

(b) an inner portion being disposed about a longitudinal axis and having a first surface forming an angle substantially equal to said angle alpha with said inner portion longitudinal axis, and a second surface adjacent to said inner portion first surface and forming an angle substantially equal to said angle beta therewith;

(c) an electrically insulating seal disposed about a longitudinal axis and having a first segment forming an angle substantially equal to said angle alpha with said seal longitudinal axis and a second segment adjacent to said first segment and forming an angle substantially equal to said angle beta therewith;

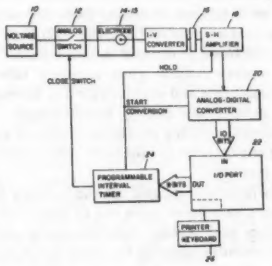
(d) means for urging said inner and said outer portions toward one another, wherein said inner, said outer and said seal longitudinal axes are subsantially coaxially aligned such that said first seal segment provides an electrically insulating seal and is engaged between said inner and said outer portion first surfaces and said second seal segment provides an electrically insulating seal and is engaged between said inner and said outer portion second surfaces; and

(e) means for operatively shielding said insulating seal from the internal deposition chamber when said seal is operatively mounted between said inner and outer portions, wherein said seal is protected from direct exposure to conductive coating particles moving within the deposition chamber; whereby said inner and said outer portions can be operatively maintained at different electrical potentials and whereby said mounting assembly resists leaks between said inner and said outer portions when a differential fluid pressure is placed across said mounting assembly.

4,556,472
COMPUTERIZED DEVICE FOR PULSED POTENTIAL VOLTAMMETRIC MEASUREMENT OF OXYGEN USING A MEMBRANCE COVERED POLAROGRAPHIC ELECTRODE

Christopher Langdon, Kingston, R.I., assignor to Board of Governors for Higher Education, State of RI and Providence Plantations, both of Providence, R.I.

Division of Ser. No. 369,474, Apr. 19, 1982, Pat. No. 4,464,230.
This application Jun. 27, 1984, Ser. No. 625,134
Int. Cl.[4] G01N *27/46*
U.S. Cl. 204—406 9 Claims



1. An apparatus for determining the level of oxygen in a fluid stream which comprises:

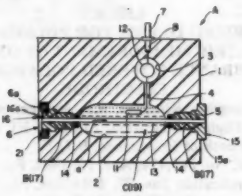
(a) means to place an electrode in electrolytic communication with a fluid stream containing oxygen;
(b) means to energize the electrode for a first duration of time (d) and to prevent energization of the electrode for an interval of time (i), which interval of time (i) is longer than the duration time (d), the electrode providing a first signal corresponding to the oxygen to be measured derived from time (d);
(c) means to sample repeatedly over at least one cycle of the predominant noise frequency the first signal generated from the electrode which signal corresponds to time (d), the first signal sampled at a rate over at least the one cycle of the predominant noise frequency such that the sampled signal when averaged provides a signal substantially free of drift;
(d) means to average the signals so sampled;
(e) means to store the signals so averaged;
(f) means to provide a second signal corresponding to the salinity of the fluid stream;
(g) means to input the value of the salinity into the apparatus;
(h) means to calculate salinity correction factors;
(i) means to apply the salinity corection factors to stored averaged signals to produce data corresponding to the level of the oxygen in the fluid stream being measured; and
(j) computer means to control the energization of the electrode; and the sampling, averaging and storing of the signals; and the calculation of the salinity correction factors and the application of the correction factors to the averaged signals.

4,556,473

FLOW THROUGH TYPE GLASS ELECTRODE

Takeshi Kohno, and Seiji Usui, both of Kyoto, Japan, assignors to Horiba, Ltd., Kyoto, Japan

Filed Feb. 8, 1985, Ser. No. 699,836
Claims priority, application Japan, Jun. 2, 1984, 59-82065[U]
Int. Cl.⁴ G01N *27/36*
U.S. Cl. 204—409 **7 Claims**



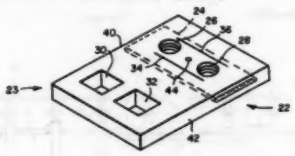
1. A flow through type glass electrode comprising:
a resin body having a hollow interior and having bores in the opposite ends thereof extending from the outside of said body into said interior and aligned with each other;
an internal electrode positioned in said interior;
a straight unitary hollow glass capillary tube extending through said bores and said interior and having a uniform diameter sample flow passage therethrough;
sealing members in sealing engagement around said tube and in sealing engagement in said bores where said bores open into said interior;
plugs closely fitted around said tube and closely fitted in said bores where said bores open out of said body and being spaced from said sealing members along said bores to define an insulating material receiving space therebetween and extending along each bore;
an insulating material filling said insulating material receiving spaces; and
an internal liquid filling said interior.

4,556,474

DEVICE FOR DETERMINING IONIC ANALYTE ACTIVITY

Charles W. Pierson, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 437,221, Oct. 28, 1982, Pat. No. 4,468,271.
This application Jul. 5, 1984, Ser. No. 605,339
Int. Cl.⁴ G01N *27/30*
U.S. Cl. 204—416 **8 Claims**



3. A device for determining the ionic analyte activity in a contacting sample of a test liquid with a contacting sample of a reference liquid, said device comprising:
an electrically insulative frame;
a pair of solid electrodes mounted in a spaced-apart relationship on a surface of said frame;
a cover sheet extending over both of said electrodes, said sheet formed of a nonporous material;
a pair of liquid access holes having a common centerline and extending through said cover sheet for receiving said liquid samples each of said liquid access holes being aligned with a different electrode;
a capillary bridge formed of a porous material encapsulated in said cover sheet and extending at least between said liquid access holes for providing ionic flow of said liquid samples received in said liquid access holes; and
at least one substantially continuous stretch line located in said cover sheet directly over said capillary bridge and extending generally in the direction of said common center line.

4,556,475

ELECTROCHEMICAL GAS SENSOR PROBE CONSTRUCTION

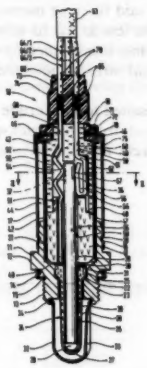
Kurt Bayha, Oberriexingen, and Helmut Weyl, Schwieberdingen, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jul. 6, 1984, Ser. No. 628,454
Claims priority, application Fed. Rep. of Germany, Jul. 29, 1983, 3327397
Int. Cl.⁴ G01N *27/46*
U.S. Cl. 204—427 **13 Claims**

1. Gas-content sensor probe having a casing (11) equipped with means for fastening said casing gas-tight in the wall of a pipe in which a gas to be measured flows, said casing having a central bore, said probe having a casing-extension shell (17, 74) extending from an extremity away from said pipe substantiallly to said casing and closed off at said extremity against entry of moisture and dirt, a tube-shaped sensor element (26) held at one end in said central bore of said casing and also a rod-shaped part (35) occupying most of the interior cavity of said sensor element with a portion of said rod-shaped part that on its surface carries a heating element and having at least two contact surface portions (36) in the region of the rod end remote from said sensor element, against which contact portions a plurality of resilient contact elements (58, 59) respectively bear under mechanical bias, and are connected with electrical connection lead wires for said probe, said rod-shaped part having at least one configuration feature for positioning against rotation.
said resilient contact elements (58, 59), said end and said contact portions of said rod-shaped part (35), and said at

least one positioning configuration feature (37) of said rod-shaped part being located within the portion of said probe enclosed by said casing and said casing extension shell;

each of said resilient contact elements connected to said connection lead wires being a wire held in a cavity (56, 57) in a first insulating part (40) and provided with a portion (62) at one end of said cavity bent successively in opposite directions in substantially the same plane, said portion at least in part abutting on a first shoulder (61) facing said cavity (56, 57), each of said resilient wires also being bent, at another end of said cavity substantially in said same plane to provide a reversely bent wire end running along



the surface of said rod-shaped part (35) for contact with one of said contact portions (36) thereof, and said reversely bent portions of said resilient wires being supported in an electrically insulating manner by abutment on a second shoulder (66) of a second insulating part (41) facing said first shoulder across said cavity and facing in the direction away from said sensor element, each of said resilient wires passing through said first insulating part in a guiding hole leading from said cavity (56, 57) to a place where the resilient wire protrudes from said first insulating part for connection, within an elastic insulating plug (69) that closes said extremity of said casing-extension shell, to one of said connection lead wires.

4,556,476

METHOD FOR MINIMIZING FOULING OF HEAT EXCHANGER

Richard F. Miller, Humble, and Michael P. Nicholson, Houston, both of Tex., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Aug. 10, 1984, Ser. No. 639,896
Int. Cl.[4] C10G *9/16*
U.S. Cl. 208—48 AA **5 Claims**

1. In a method of inhibiting fouling of hydrocarbon processing equipment during the processing of hydrocarbons at elevated temperatures comprising introducing into the equipment an amount of an antifoulant agent effective to substantially reduce the rate of fouling, the improvement comprising using as the agent a composition comprised of:

(a) at least one member selected from the N,N' dimers of (1) phenothiazine, (2) halo-substituted phenothiazines, (3) alkyl-substituted phenothiazines and (4) haloalkyl-substituted phenothiazines, and

(b) at least one hydroxylamine containing two N-substituted hydrocarbon groups each of which contains an aromatic radical.

4,556,477

HIGHLY SILICEOUS POROUS CRYSTALLINE MATERIAL ZSM-22 AND ITS USE IN CATALYTIC DEWAXING OF PETROLEUM STOCKS

Francis G. Dwyer, West Chester, Pa., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 587,327, Mar. 7, 1984, abandoned, which is a division of Ser. No. 373,451, Apr. 30, 1982. This application Oct. 19, 1984, Ser. No. 662,660
Int. Cl.[4] C10G *47/16*
U.S. Cl. 208—111 **6 Claims**

1. A process for catalytic dewaxing of petroleum stocks comprising contacting the petroleum stocks, in the presence or absence of added hydrogen, with a ZSM-22 zeolite catalyst under conditions including a temperatue of about 300–1000° F., a pressure of 0–2000 psig, a liquid hourly space velocity of 0.1 to 10 and a hydrogen to hydrocarbon ratio of about 0 to 25:1.

4,556,478

HYDROCARBON CONVERSION PROCESS AND CATALYST COMPOSITION

Tomonori Shioiri, Yokohama, and Takashi Ino, Kawasaki, both of Japan, assignors to Research Association for Residual Oil Processing, Tokyo, Japan

Division of Ser. No. 578,104, Feb. 8, 1984, Pat. No. 4,515,902. This application Mar. 15, 1985, Ser. No. 712,033
Claims priority, application Japan, Feb. 16, 1983, 58-22901
Int. Cl.[4] C10G *11/05*
U.S. Cl. 208—120 **2 Claims**

1. A fluid catalytic cracking process for a distillation residue-containing heavy oil containing not less than 0.5 ppm as a total amount of nickel and vanadium, characterized in that said heavy oil is subjected to a fluid catalytic cracking in the presence of a catalyst, said catalyst comprising 3 to 40 weight percent of a crystalline aluminosilicate zeolite and 60 to 97 weight percent of an alumina-magnesia matrix having a magnesia content of 2 to 50 weight percent.

4,556,479

METHOD FOR THE CLEAN-UP OF PARTICULATE-CATALYST CONTAINING GASES

Jean-Louis Mauleon, Aurora; Robert J. Newman, Englewood, and Alan J. Black, Littleton, all of Colo., assignors to Total Engineering and Research Company, Denver, Colo.

Filed Apr. 10, 1984, Ser. No. 598,705
Int. Cl.[4] C10G *11/18;* B01J *29/38;* B01D *45/16*
U.S. Cl. 208—164 **24 Claims**

1. A method for the separation of particulate-catalyst containing gases comprising:

providing a housing having means dividing said housing into at lest an upper and a lower zone;

locating at lest one cyclone separating means in said upper zone;

maintaining said upper zone at a first pressure which is substantially spacially uniform;

maintaining said lower zone at a substantially uniform second pressure;

inputting particulate-catalyst containing gases at said first pressure to said cyclone-separating means to separate said particulate-catalyst containing gases into a substantially particulate-catalyst free gaseous overflow and a gas-containing particulate-catalyst underflow;

exiting said underflow at said second pressure said second pressure being less than said first pressure; and

controlling the amount of said gas in said gas-containing underflow by controlling the difference between said first pressure and said second pressure.

5. A method for the separation of catalyst particles suspended in flue gases comprising:

providing a housing having means dividing said housing into at least an upper zone and a lower zone;

maintaining said upper zone at a pressure which is substantially spatially uniform;

maintaining said lower zone at a substantially uniform pressure lower than the pressure in said upper zone;

locating cyclone separating means in said upper zone;

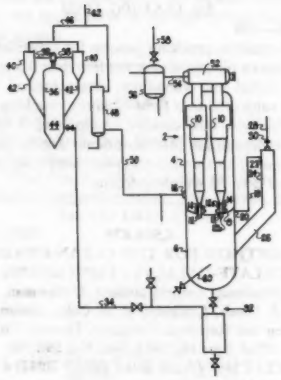
passing flue gases having entrained catalyst particles into said upper zone;

continuously moving portions of said flue gases into said cyclone separating means to separate said catalyst particles from said flue gases;

passing separated catalyst fines and some accompanying underflow gas into said lower zone while limiting said accompanying underflow gas to from about 0.5 to 5.0 volume percent of said flue gases passed into said upper zone; and

recovering flue gases separated from the entrained catalyst fines.

14. In a combination process of catalyst regeneration and hydrocarbon conversion with hot catalyst particles recovered from catalyst regeneration, a method for recovering heat and catalyst particles from regenerated flue gases which comprises:



passing high temperature regenerated flue gases through a heat exchanger to generate steam and cool said regenerated flue gases;

providing a housing having means dividing said housing into at least an upper zone and a lower zone;

passing said cooled regenerated flue gases into said upper zone;

locating cyclone separating means in said upper zone with means thereon extending downwardly and terminating for discharge in said lower zone;

continuously moving portions of said cooled regenerated flue gases with entrained catalyst fines at a first uniform pressure into said cyclone separating means; and

passing separated catalyst fines and underflow gases from said cyclone separating means into said lower zone while maintaining said lower zone at a uniform pressure less than said first pressure so as to limit the flow of said underflow gas to from about 0.5 to 5.0 volume percent of said cooled regenerated flue gases passed into said upper zone.

4,556,480

REMOVAL OF TOPPED CRUDE DEMINERALIZATION SEDIMENT BY BACKWASHING FILTER TO CRUDE OIL DESALTING PROCESS

Vernon A. Cawi, and Barry J. Stengle, both of Sweeny, Tex., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 23, 1984, Ser. No. 643,350

Int. Cl.[4] C10G *33/06, 45/00*

U.S. Cl. 208—211 **4 Claims**

1. A method for removing minerals from an at least partially desalted, topped crude oil comprising:

(a) passing said at least partially desalted, topped crude oil, through a filtering means with mineral sediment retained on said filtering means to provide a topped crude oil stream reduced in mineral sediment,

(b) backwashing said filtering means with at least partially desalted, topped crude oil to remove mineral sediment from the filtering means thereby providing a desalted, topped crude oil stream increased in mineral sediment, and

(c) passing the desalted topped crude oil stream increased in mineral sediment from the backwashing to a desalting operation wherein mineral sediment is at least partially removed.

4,556,481

APPARATUS FOR SEPARATING PARTICULATE MATERIALS

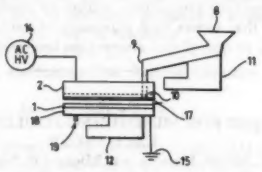
Nicholas M. Hepher, Lamberhurst, England, assignor to Blue Circle Industries plc, London, England

Filed Nov. 15, 1983, Ser. No. 551,869

Claims priority, application United Kingdom, Nov. 17, 1982, 8232857

Int. Cl.[4] B03C *7/04*

U.S. Cl. 209—127 **9 Claims**



1. A method of separating particles having different physical properties, which comprises generating an alternating electric field, the electric field having a first region having field lines curved convexly in a first direction generally perpendicular to a given direction; introducing the particles into the field; charging at least some of the particles; and causing the particles to move on a surface along the field in the said given direction, whereby a charged particle acted upon by the electric field in the said first region is subjected to a centrifugal force in the said first direction, characterised in that the said surface is gas-permeable and slopes downwards in the said given direction, and in that gas is passed up through the gas-permeable surface whereby the particles are fluidised within the said electric field and are thereby permitted to move along the field in the given direction under the force of gravity.

4,556,482

PROCESS FOR THE FLOTATION OF BASE METAL SULFIDE MINERALS IN ACID, NEUTRAL OR MILDLY ALKALINE CIRCUITS

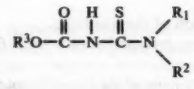
D. R. Nagaraj, Stamford, Conn., assignor to American Cyanamid Company, Stamford, Conn.

Filed Aug. 17, 1984, Ser. No. 641,659
Int. Cl.[4] B03D 1/14
U.S. Cl. 209—166 11 Claims

1. A process for the benefication of copper sulfide minerals from base metal sulfide ores with selective rejection of iron gangue minerals and other gangue sulfides at a pH value of less than or equal to 10.0, said process comprising:

(a) providing an aqueous slurry of finely divided liberation-sized ore particles having a pH of less than or equal to 10.0;

(b) conditioning said pulp slurry with effective amounts of a frothing agent and a metal collector, respectively, said metal collector comprising at least one hydrocarboxycarbonyl thiourea compound having the formula:



wherein R^1 is hydrogen or R^2; R^2 is a saturated or unsaturated alkyl radical; and R^3 is a saturated or unsaturated alkyl radical; and

(c) thereafter, frothing the copper sulfide minerals by froth flotation.

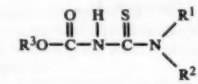
4,556,483

NEUTRAL HYDROCARBOXYCARBONYL THIOUREA SULFIDE COLLECTORS

Yun-Lung Fu, Milford, and Samuel S. Wang, Cheshire, both of Conn., assignors to American Cyanamid Company, Stamford, Conn.

Filed Aug. 17, 1984, Ser. No. 641,660
Int. Cl.[4] B03D 1/14
U.S. Cl. 209—166 15 Claims

1. A collector composition for froth flotation of base metal sulfide minerals comprising at least one hydrocarboxycarbonyl thiourea compound selected from compounds having the formula:



wherein R^1 is hydrogen or R^2, R^2 is a saturated or unsaturated alkyl radical; and R^3 is a saturated or unsaturated alkyl radical.

4,556,484

WATER FILTERS

Charles L. Hunter, Loveland; Payton D. Fuller, and David K. Mutchler, both of Ft. Collins, all of Colo., assignors to Teledyne Industries, Inc., Fort Collins, Colo.

Filed Jul. 5, 1983, Ser. No. 510,979
Int. Cl.[4] B01D 35/02
U.S. Cl. 210—90 37 Claims

1. A water filter unit for connection into a water line which feeds a valve-controlled faucet separate from said filter unit, said unit comprising:

a canister;

a filter cartridge seated within said canister with said cartridge having means definng an inlet and outlet;

a cap to which said canister is removably attached;

means defining an input entrance port in said cap disposed to communicate with said outlet;

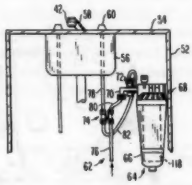
means defining an exit in said cap disposed to communicate with said inlet;

means defining an input port in said cap for receiving water from said line;

means defining an output in said cap for delivering water into said line to feed said faucet;

means defining a passage in said cap communicating between said input port and said exit port;

means defining a passageway communicating between said input port and said output port;



means defining in said cap communicating between said entrance port and said output port;

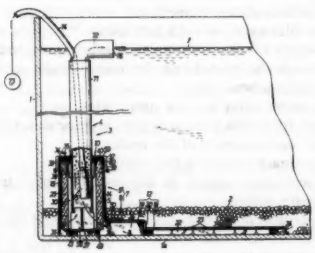
and a diverter in said cap responsive in a first condition to a rate of water flow from said faucet of less than a predetermined amount for opening said passage and said channel and closing said passageway and responsive in a second condition to a rate of water flow from said faucet of more than said predetermined amount for closing said passage and said channel and opening said passageway.

4,556,485

FILTER

Yonekichi Ogawa, Tokyo, Japan, assignor to Suisaku Kabushiki Kaisha, Tokyo, Japan

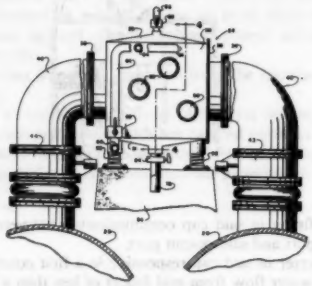
Filed Jul. 31, 1984, Ser. No. 636,475
Claims priority, application Japan, Feb. 20, 1984, 59-29891
Int. Cl.[4] B01D 23/16
U.S. Cl. 210—169 6 Claims



1. In a filter of the type in which at least part of a casing is buried together with its suction ports in pebbled spread inside a water tank in order to let said pebbles exhibit a filter operation, and suction means is connected to said casing, the improvement wherein said casing consists of a suction portion buried in said pebbles together with suction ports thereof, and a purification portion connected to said suction portion and having an upper part thereof closed by a detachable lid; said filter further comprises a filter material dividing said purification portion into a purification chamber and a non-purification chamber and a frame member removably fitted into said purification portion holding said filter material; said suction means is supported by said lid in such a manner as to face the interior of said purification chamber; and a water flow path is provided in said casing for introducing water directly into said purification

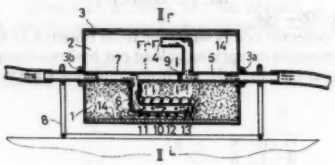
chamber of the purification portion while bypassing said filter material.

4,556,486
CIRCULATING WATER FILTERING SYSTEM AND METHOD OF OPERATION
Lesley Merket, 904 Rusk, Colorado City, Tex. 79512
Filed Feb. 15, 1984, Ser. No. 580,530
Int. Cl.[4] E02B *9/00*
U.S. Cl. 210—170 **3 Claims**



1. A system for supplying circulating water to an industrial plant involving,
(a) a circulating water intake for the industrial plant including head exchangers,
(b) the water intake being fluidly connected to tubes, having tube diameters, equal to that of the heat exchangers in said plant,
(c) a tunnel adapted to fluidly connect the water intake to a source of the circulating water contained in a lake,
(d) pump means fluidly connected to the tunnel operative to flow at least 100,000 gallons per minute of the circulating water from the lake through the tunnel and water intake to the heat exchangers;
wherein the improvement comprises:
(e) at least three filter units connected in parallel, with
(f) inlets of the filter units fluidly in communication with the lake through the tunnel,
(g) an inlet valve in each unit inlet,
(h) outlets of the filter units fluidly connected in parallel through the tunnel and the water intake to the heat exchanger tubes, and
(i) an outlet valve in each unit outlet,
(j) each filter unit also having an interior downstream of the inlet and upstream of the outlet,
(k) a primary screen in the interior, and
(l) a secondary screen in the interior downstream of the primary screen,
(m) apertures in each secondary screen about the diameter of the heat exchanger tubes,
(n) apertures in each primary screen larger than the apertures in the secondary screens,
(o) the inlet and outlet of each unit fluidly connected through the apertures of the screens,
(p) a secondary sprayer in each unit interior downstream of the secondary screen thereof,
(q) a primary sprayer in each unit interior between the primary and secondary screens thereof,
(r) each sprayer having at least two spray tubes somewhat parallel to the screen that is upstream from the spray tubes,
(s) a spray manifold fluidly connecting one end of the spray tubes of each sprayer,
(t) nozzles on each spray tube oriented upstream toward the screen immediately upstream from that spray tube,
(w) a source of wash water,
(v) backwash means on each unit for passing the wash water from the wash water source through the nozzles against the screens when the outlet and inlet are both blocked, including
(w) a wash pipe fluidly connecting the spray manifolds of each unit to the source of wash water,
(x) a wash pump fluidly connected to each of the wash pipes for pumping wash water under pressure from the source of wash water through each of the wash pipes to the nozzles, and
(y) a wash valve in each of the wash pipes for disconnecting and connecting the source of wash water and the spray manifolds of each unit,
(z) a drain on each unit for draining the wash water, and particles washed off the screens,
(aa) a valve in each drain for blocking that drain,
(bb) a vent on each unit fluidly connecting the unit interior to atmosphere,
(cc) a valve in each vent for blocking that vent,
(dd) each of the filter units having a manhold therein through which a workman may enter the filter interior, and
(ee) a manhole cover over each of the manholes,
(cc) a concrete foundation on ground beneath each filter unit,
(gg) springs mounting the filter units to the concrete foundations to accommodate flexing of the tunnels and filter units.

4,556,487
WATER FILTERING DEVICE
Yoshihiko Ueda, Yamaguchi, Japan, assignor to Takara Kogyo Co., Ltd., Tokyo, Japan
Filed Apr. 5, 1984, Ser. No. 596,942
Int. Cl.[4] B01D *33/16*
U.S. Cl. 210—267 **11 Claims**



1. A water filter device comprising:
a substantially horizontal rotatable drum having a filter layer therein composed of a granular filter material and a space above said filter layer, said rotatable drum being rotatable about its own horizontal axis;
a first water flow pipe extending into said rotatable drum coaxially with the axis of said drum and having a first branch extending radially upwardly in said drum and into said space for introducing crude water to be filtered into said rotatable drum and discharging waste washing water from said rotatable drum;
a second water flow pipe extending into said rotatable drum coaxially with the axis of said drum and having a second branch extending radially downwardly in said drum and into said filter layer for discharging filtered water from said rotatable drum and introducing washing water into said rotatable drum;
said rotatable drum being rotatably mounted on said first and second water flow pipes, and said first and second water flow pipes being fixed within said drum and said drum being rotatable around said pipes.

4,556,488
APPARATUS FOR FILTERING AND SEPARATING LIQUID AND GASEOUS MEDIA

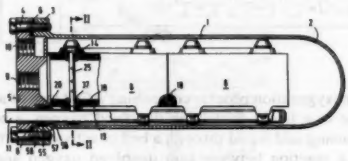
Hans Timm, and Heinz Griesbach, both of Geesthacht, Fed. Rep. of Germany, assignors to GKSS-Forschungszentrum Geesthacht GmbH, Geesthacht-Tesperhude, Fed. Rep. of Germany

Filed May 10, 1984, Ser. No. 608,904

Claims priority, application Fed. Rep. of Germany, May 13, 1983, 3317517

Int. Cl.⁴ B01D *13/00*

U.S. Cl. 210—321.1 **4 Claims**



1. Apparatus for treatment of fluids by filtration and the like, comprising an elongated outer housing which has a closed end and has an inlet for untreated fluid at its opposite end, an outlet duct extending lengthwise in said outer housing, adjacent to one side thereof, having a closed end adjacent to said closed end of the outer housing and having its opposite end accessible at said opposite end of the outer housing, a plurality of elongated inner housing elements arranged lengthwise adjacent to one another in said outer housing, each said inner housing element comprising a substantially trough-shaped body portion that has an opening at one lateral side thereof and a cover that closes said opening, each said inner housing element having opposite open ends through which untreated fluid can flow in the direction away from said closed end of the outer housing successively through said inner housing elements, a stack of substantially flat membrane cushions in each inner housing element that have their surfaces substantially parallel to its length, each said membrane cushion comprising a pair of spaced apart membrane sheets that fluid permeates for treatment and each having a hole therethrough, said cushions being separated by spacers each of which likewise has a hole, and a tubular connector for each said stack extending through said holes and having radial openings through which fluid from between the membrane sheets of each cushion can enter the interior of the connector, each said connector extending across the interior of an inner housing element, through its cover and through the wall of its body portion that is opposite its cover, and being communicated at one end with said outlet duct to discharge treated fluid thereinto, said apparatus being characterized by:

A. means securing each said inner housing element individually and directly to said outlet duct so that the inner housing elements are connected with one another only by said outlet duct; and

B. said inner housing elements being secured to said duct in endwise spaced relationship to one another that generates turbulence in untreated fluid flowing successively through them.

4,556,489
MEMBRANE OXYGENATOR

Lambert J. Diettrich, Jr., Leucadia, and Francis M. Servas, San Juan Capistrano, both of Calif., assignors to Shiley Incorporated, Irvine, Calif.

Filed Mar. 9, 1983, Ser. No. 473,508

Int. Cl.⁴ B01D *31/00*

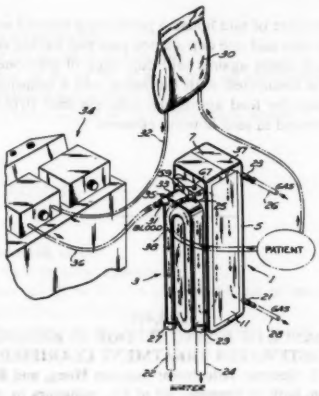
U.S. Cl. 210—321.3 **12 Claims**

1. A mass transfer device for the treatment of blood comprising:

a housing;

a pleated, selectively permeable membrane disposed within the housing in substantially rectangular folds defining first and second sets of alternating pockets for the flow of blood and a treating fluid;

a plurality of discrete non-woven support screens having substantially the same width as said folds, with one of said screens being disposed within each of said pockets of said first and second sets, said membrane and screens being held in said housing as a compacted stack compressed in a direction normal to the substantially rectangular surfaces of said folds with the screens disposed within adjacent blood and treating fluid pockets and separated by the membrane being substantially intedigitated, and with said support screens consisting essentially of a first layer in a first plane of first strands spaced apart and substantially parallel to one another and a second layer in a second plane of second strands apart and substantially parallel to one another, said first layer and said second layer being



bonded together at points of contact and said first strands beng oriented with respect to said second strands at an angle of from about 45° to 90°, and said first strands and said second strands in said blood pocket and treating fluid pocket support screens being all oriented at acute angles of from about 20° to about 70 ° with respect to the fold lines of said membrane;

blood inlet and outlet means in the housing adjacent opposed ends of said stack in communication with the first set of pockets, thereby establishing overall blood flow paths in the first set of pockets along the length of said pockets; and

treating fluid inlet and outlet means in the housing adjacent opposed ends of said stack in communication with the second set of pockets, thereby establishing overall treating fluid flow paths in the second set of pockets along the length of said pockets.

4,556,490
ARRANGEMENT FOR FEEDING OF FUEL

Ulrich Kemmner, Stuttgart, and Wolfgang Soyer, Wiernsheim, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Mar. 5, 1984, Ser. No. 586,093

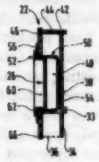
Claims priority, application Fed. Rep. of Germany, Mar. 19, 1983, 3309971

Int. Cl.⁴ B01D *35/02*

U.S. Cl. 210—349 **13 Claims**

1. An arrangement for feeding fuel, for example from a supply tank to an internal combustion engine of a power vehicle, comprising a feed aggregate through which a fuel flows; a structural element arranged in the fuel flow and having a supporting frame, and a filter part and a fuel pressure wave

damping member arranged on said supporting frame, said damping member having two housing parts which enclose a gas-filled chamber, one of said housing parts being formed on said supporting frame of one-piece with the latter and having an cup-shaped cross-section with a cup bottom located inside said supporting frame and a cup edge connected with the



latter, the other of said housing parts being formed as a carrier insertable into said one cup-shaped part and having an annular edge which abuts against said cup edge of said one housing part and is connected with the same; and a housing element surrounding the feed aggregate, wherein said structural element is located in said housing element.

4,556,491

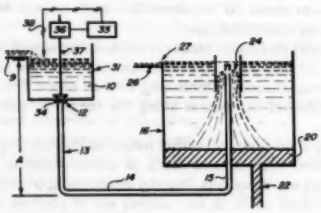
AVOIDANCE OF RISING SLUDGE IN BIOLOGICAL WASTEWATER TREATMENT CLARIFIERS

Marshall L. Spector, Allentown; Sun-nan Hong, and Robert P. Seebohm, both of Emmaus, all of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Continuation of Ser. No. 537,470, Sep. 29, 1983, abandoned. This application Dec. 3, 1984, Ser. No. 677,715

Int. Cl.⁴ C02F 3/12

U.S. Cl. 210—608 **16 Claims**



8. In an activated sludge system for treatment of wastewater wherein a mixed liquor comprising aerated wastewater and sludge-forming biomass is passed from an aeration zone to a clarifier via an open channel flowing to an effluent basin, the method of inhibiting rising of settled sludge in the clarifier which comprises: containing said wastewater in the open channel under conditions such as to assure that macrobubbles are allowed time to rise and the rate of rise of the macrobubbles exceeds the downward flow rate of mixed liquor in the effluent basin, maintaining conditions during discharge of the mixed liquor from said channel to the basin so as to avoid reentrainment of macrobubbles into the mixed liquor, and subsequently subjecting the mixed liquor to a hydraulic pressure effective to promote dissolution of contained microbubbles prior to introducing the mixed liquor into the clarifier.

4,556,492

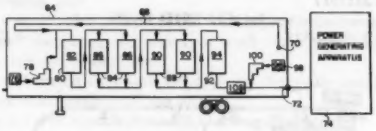
DEOXYGENATION PROCESS

Richard C. Dickerson, and William S. Miller, both of Virginia Beach, Va., assignors to Ecolochem, Inc., Norfolk, Va.

Filed Dec. 16, 1983, Ser. No. 562,001

Int. Cl.⁴ C02F 9/00

U.S. Cl. 210—668 **18 Claims**



1. A deoxygenation process comprising a first step of adding hydrazine to a liquid containing dissolved oxygen, a second step of passing said liquid through a bed of activated carbon to catalyze a reaction between said dissolved oxygen and said hydrazine whereby an amount of dissolved carbon contaminants are added to said liquid, and a third step of passing said liquid through an ion exchange resin selected from the group consisting of mixed bed resin and cation resin to remove at least said dissolved contaminants.

4,556,493

COMPOSITION AND METHOD FOR INHIBITING SCALE

Dionisio G. Cuisia, Chicago, Ill., assignor to Dearborn Chemical Company, Lake Zurich, Ill.

Continuation of Ser. No. 467,141, Feb. 16, 1983, abandoned. This application Mar. 7, 1985, Ser. No. 709,822

Int. Cl.⁴ C02F 5/12, 5/14

U.S. Cl. 210—699 **2 Claims**

1. A composition for inhibiting formation of scale in an aqueous system comprising an aqueous solution of a composition comprising

(a) from about 2 to about 6 parts by weight of a copolymer of maleic acid or anhydride and styrene sulfonic acid or a water soluble salt thereof, said copolymer having a molecular weight of from about 1,000 to about 25,000 and a styrene sulfonic acid to maleic acid or anhydride mole ratio of from about 1:1 to about 4:1;

(b) from about 0.5 to about 5 parts by weight of hydroxyethylidene-1,1-diphosphonic acid or a water soluble salt thereof; and

(c) from about 0.5 to about 5 parts by weight of nitrilotriacetic acid or a water soluble salt thereof.

2. A method of inhibiting formation of scale in a steam generating boiler comprising adding to the boiler water an aqueous solution of a composition comprising

(a) from about 2 to about 6 parts by weight of a copolymer of maleic acid or anhydride and styrene sulfonic acid or a water soluble salt thereof, said copolymer having a molecular weight of from about 1,000 to about 25,000 and a styrene sulfonic acid to maleic acid or anhydride mole ratio of from about 1:1 to about 4:1;

(b) from about 0.5 to about 5 parts by weight of hydroxyethylidene-1,1-diphosphonic acid or a water soluble salt thereof; and

(c) from about 0.5 to about 5 parts by weight of nitrilotriacetic acid or a water soluble salt thereof; said composition being added in an amount of from about 0.1 to about 50 parts per million of water in the boiler.

4,556,494

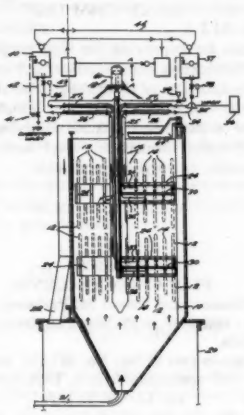
METHOD OF DIFFUSION WASHING OR THICKENING OF PULP

Johan C. F .C. Richter, St. Jean Cap Ferrat, France, and Ole J. Richter, Karlstad, Sweden, assignors to Kamyr Aktiebolag, Karlstad, Sweden

Continuation of Ser. No. 213,102, Dec. 4, 1980, abandoned, which is a division of Ser. No. 34,928, Apr. 25, 1979, Pat. No. 4,276,167. This application Mar. 12, 1985, Ser. No. 712,312

Int. Cl.⁴ B01D *33/00*

U.S. Cl. 210—785 **3 Claims**



1. A method of treating pulp having a consistency of 6 to 15%, utilizing an elongated upright hollow vessel having a plurality of interspersed withdrawal screens, in at least two screen sets, and fluid introducing structures, in sets corresponding to the screen sets, mounted therein extending generally parallel to the vessel direction of elongation, the method comprising the steps of:

passing the pulp upwardly in the vessel;

introducing fluid into the pulp through the fluid introducing structures so that the fluid flows horizontally;

withdrawing fluid from the pulp through the withdrawal screens and transporting it to a location remote from the vessel so that fluid introduced by one set of fluid introducing structures is removed by the screens of that same set;

withdrawing the pulp from the top of the vessel after treatment thereof; and

reciprocating the screens and the fluid introducing structures together, remaining stationary with respect to each other, so that they both move upwardly and downwardly in the vessel along the vessel direction of elongation.

4,556,495

IMMISCIBLE DISPLACEMENT OF OIL WITH SURFACTANT SYSTEM

James E. Shaw, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

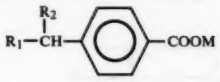
Filed Jun. 28, 1983, Ser. No. 508,637

Int. Cl.⁴ E21B *43/16*

U.S. Cl. 252—8.55 D **21 Claims**

1. A method for immiscibly displacing oil from a subsurface earth formation containing the same comprising:

injecting into said subsurface earth formation a surfactant system comprising an aqueous mixture of an alkali metal carboxylate selected from the group consisting of carboxylates represented by formulas 1, 2, 3 and 4 below:



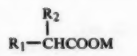
(1)

M is an alkali metal

where:

R_1 and R_2 are the same or different alkyl substituents and $R_2 \leqq R_1$; and

R_1 and R_2 have a total of 6 to 24 carbon atoms;



(2)

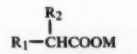
where:

M is an alkali metal;

R_1 or R_2 is an alkyl substituent;

the other of R_1 or R_2 is a phenyl, an alkylphenyl or a phenylalkyl substituent; and

R_1 and R_2 have a total of 10 to 30 carbon atoms;



(3)

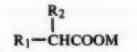
where:

M is an alkali metal;

R_1 or R_2 is an alkyl substituent;

the other of R_1 or R_2 is a cycloparaffinic or an alkylcycloparaffinic substituent; and

R_1 and R_2 have a total of 10 to 30 carbon atoms;



(4)

where:

M is an alkali metal;

R_2 is an alkyl substituent;

R_1 is an alkyl, alkenyl or alkadienyl substituent having 1–18 carbon atoms; and

R_1 and R_2 have a total of 6 to 24 carbon atoms;

an organic polar cosurfactant having a solubility in water of less than about 10 g per 100 g of water at 20° C. when a carboxylate of formula (4) is utilized or a solubility in water of 10 g per 100 g of water at 20° C. or greater when a carboxylate of formulas 1, 2 or 3 is utilized, an electrolyte in concentrations and proportions sufficient to form an immiscible, three-phase mixture with said oil comprising a predominately oil phase, a microemulsion phase and a predominately aqueous phase and a base in an amount sufficient to significantly alter the pH of said surfactant system and obtain optimal immiscible displacement of said oil.

4,556,496

REFRIGERATION LUBRICATING OIL CONTAINING DIALKYL SULFOSUCCINATE

David J. Glova, Hercules, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Mar. 28, 1984, Ser. No. 594,071

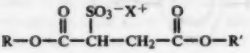
Int. Cl.⁴ C10M *3/34*

U.S. Cl. 252—33 **7 Claims**

1. A refrigeration lubricating oil composition comprising:

(A) a branched-chain alkylbenzene or mixture of branched-chain alkylbenzenes, each having one or more branched side chains of 5 to 25 carbon atoms and each containing a total of from 10 to 25 carbon atoms in the alkyl groups; and

(B) about 50 ppm to 5 weight percent of a dialkyl sulfosuccinate of the formula



wherein R and R′ are independently alkyl or cycloalkyl of 3 to 7 carbon atoms; and X is selected from the group consisting of hydrogen, lithium, sodium, potassium and ammonium.

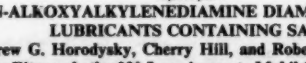
4,556,497

N-ALKOXYALKYLENEDIAMINE DIAMIDES AND LUBRICANTS CONTAINING SAME

Andrew G. Horodysky, Cherry Hill, and Robert M. Gemmill, Jr., Pitman, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Jun. 29, 1983, Ser. No. 508,979
Int. Cl.⁴ C10M *1/36*
U.S. Cl. 252—51.5 A **22 Claims**

1. The product of the formula



wherein R is a hydrocarbyl group containing from 6 to 20 carbon atoms, R^1 and R^2 are C_2 to C_3 hydrocarbylene groups and R^3 is hydrogen or

wherein R^4 is hydrogen or a C_1 to C_3 alkyl group, at least one of the R^3 groups being the latter.

4,556,498

INTERNAL LUBRICANT WHICH ENABLES EPOXY PHENOLIC EXTERIOR COATED TFS PLATE TO BE TRIPLE DRAWN AND IRONED

Adelaida Carbo, and Raymond H. Good, both of Barrington, Ill., assignors to American Can Company, Greenwich, Conn.

Continuation of Ser. No. 260,393, May 4, 1981, abandoned. This application Mar. 15, 1984, Ser. No. 589,793
Int. Cl.⁴ C10M *1/32*
U.S. Cl. 252—51.5 R **14 Claims**

1. A method of providing a metal substrate with a coating having increased lubricity and resistance to scuffing when the coated metal is subjected to multiple forming operations, the method including the following steps: providing a vinyl, epoxy-phenolic or epoxy-urea-formaldehyde coating material which retains adherence to a metal substrate when the latter is formed by stretching and forming operations, mixing from about 0.5 to 6% of a dry film lubricant selected from the group consisting of polyethylene wax and Carnauba wax into the coating material before application to the substrate, the dry film lubricant having a melting point higher than that of the basic coating material into which it is mixed, and applying the coating and lubricant material combination to the metal substrate in a thin film layer which is then cured to adhere it to the metal substrate, the cured coating having a softening point of at least 185° F.

4,556,499

PROCESS FOR IMPROVING THE FLOW PROPERTIES OF MINERAL OILS

Karl H. Heier, Frankfurt am Main; Roland Böhm, Kelkheim, and John V. Hobes, Dinslaken, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Continuation of Ser. No. 360,164, Mar. 22, 1982, abandoned. This application Dec. 8, 1983, Ser. No. 559,836
Claims priority, application Fed. Rep. of Germany, Mar. 28, 1981, 3112456
Int. Cl.⁴ C16M *1/32*
U.S. Cl. 252—51.5 A **6 Claims**

1. A process for improving the flow properties of middle distillates or lubricating mineral oils, which comprises adding to the middle distillates or lubricating mineral oils from 0.001 to 2 percent by weight of a copolymer which has been polymerized from a monomer mixture consisting essentially of ethylene and vinyl formamide, vinyl acetamide, vinyl-N-methyl acetamide, or vinyl propionamide.

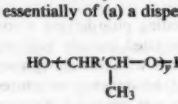
4,556,500

FLOTATION REAGENTS

Clarence R. Bresson, and Robert M. Parlman, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Continuation-in-part of Ser. No. 387,393, Jun. 11, 1982, abandoned. This application May 6, 1983, Ser. No. 489,846
Int. Cl.⁴ B03D *1/14*
U.S. Cl. 252—61 **5 Claims**

1. A novel preblended composition suitable as a collection agent consisting essentially of (a) a dispersant of the formula:



wherein R′ is either hydrogen, methyl, or ethyl and y is an integer from 6 to 17, said dispersant having a molecular weight from about 300 to about 1000, and (b) an aqueous composition made according to the process which comprises:

(1) reacting a Group IA alkali metal or ammonium hydroxide with an alkyl or alkenyl mercaptan wherein the alkyl or alkenyl group has from 2 to 12 carbon atoms; and

(2) thereafter adding to the resulting reaction product carbon disulfide in an amount sufficient to effect formation of the desired aqueous composition,

the ratio of (b) to (a) being from about 80:20 to about 99:1 parts by weight.

4,556,501

HEAT STORAGE COMPOSITION

Kenji Saita, Niihama, and Syozo Fujioka, Toyo, both of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Oct. 11, 1984, Ser. No. 659,883
Claims priority, application Japan, Oct. 13, 1983, 58-192020; Jun. 8, 1984, 59-118738
Int. Cl.⁴ C09K *5/06*
U.S. Cl. 252—70 **4 Claims**

1. A heat storage composition, consisting essentially of 2–15% by weight of a supercooling inhibitor, 2–15% by weight of calcium sulfate as a solid-liquid separation inhibitor, 0.2–1.0% by mole of the sodium sulfate of a fusion point regulator, 0.5–10% by weight of a thickener and the balance of sodium sulfate decahydrate as a main component.

4,556,502

LIQUID FABRIC-SOFTENING COMPOSITION

Eunice S. Blackmore, Merseyside; Gordon C. Peterson, Cheshire, and Gordon J. T. Tiddy, Merseyside, all of England, assignors to Lever Brothers Company, New York, N.Y.

Filed Mar. 29, 1984, Ser. No. 594,616

Claims priority, application United Kingdom, Apr. 8, 1983, 8309662

Int. Cl.[4] C11D *1/94;* D06M *13/46*

U.S. Cl. 252—8.8 7 Claims

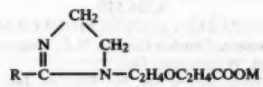
1. A liquid concentrated fabric softening composition having both good fabric softening properties and good dispersability/dispensability comprising:

(i) at least 15% by weight water;

(ii) at least 10% by weight of one or more water-insoluble cationic fabric softening agents;

(iii) from 5% to 30% non-aqueous solvent comprising an alcohol selected from the group consisting essentially of C_1–C_4 alkanols and polyhydric alcohols and mixtures thereof;

(iv) at least 0.5% of a mixture of two amphoteric surfactants, characterized in that said amphoteric surfactants are materials having the general formula



where M is a hydrogen or an alkali metal, and for one such amphoteric surfactant R is an alkyl or alkenyl group having from 8 to 15 carbon atoms and for the other such amphoteric surfactant R is an alkyl or alkenyl group having from 16 to 22 carbon atoms.

4,556,503

TRACTION DRIVE FLUIDS

Toshiyuki Tsubouchi, Sodegaura, and Hitoshi Hata, Ichihara, both of Japan, assignors to Idemitsu Kosan Company Limited, Tokyo, Japan

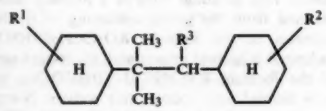
Filed Sep. 4, 1984, Ser. No. 647,110

Claims priority, application Japan, Sep. 9, 1983, 58-165064; Apr. 27, 1984, 59-83845

Int. Cl.[4] C07C *13/00;* F16H *15/08*

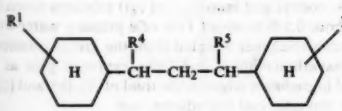
U.S. Cl. 252—73 20 Claims

1. A process for improving the coefficient of traction between at least two relatively rotatable elements in a torque transmitting relationship and for maintaining said coefficient of traction substantially constant over a broad range of operating temperatures which comprises introducing between the tractive surfaces of said elements a traction drive fluid comprising as the active component at least one compound represented by the general formulae A and B:



(A)

wherein R^1, R^2 and R^3 are each a hydrogen or a methyl or an ethyl group,



(B)

wherein R^1 and R^2 are the same as defined above, and R^4 and R^5 are each a methyl or an ethyl group.

4,556,504

AQUEOUS ALKALINE LIQUID DETERGENT COMPOSITION

Johannes H. M. Rek, Vlaardingen, Netherlands, assignor to Lever Brothers Company, New York, N.Y.

Filed Mar. 21, 1984, Ser. No. 592,039

Claims priority, application United Kingdom, Mar. 25, 1983, 8308263

Int. Cl.[4] C11D *3/06, 3/37*

U.S. Cl. 252—135 12 Claims

1. A suspending alkaline built liquid detergent composition having improved rheologic properties consisting essentially of:

(a) from 2 to 15% by weight of nonionic detergent selected from the group of polyalkoxylated fatty alcohols having in the polyalkylene-oxide radical ethylene oxide units and propylene and/or butylene oxide units wherein the overall ratio between the number of ethylene oxide units and the number of propylene and/or butylene oxide units is less than 9;

(b) from 2 to 30% by weight of an alkaline agent selected from the group consisting of alkali metal hydroxides, alkali metal orthosilicates, alkali metal metasilicates, alkali metal disilicates, and mixtures thereof;

(c) from 5 to 35% by weight of a detergency builder selected from the group consisting of the alkali metal salts of triphosphoric acid, pyrophosphoric acid, orthophosporic acid, polymetaphosphoric acid, mixtures of said salts of said acids, carbonates, zeolites, citrates, nitrilotriacetate , and mixtures thereof; and p0 (d) from 0.1 to 1.0% by weight of a single structuring polymeric agent selected from the group of cross-linked polyacrylates; and

(e) water;

wherein said composition has a pH equal to or greater than 11 and a viscosity within the range of 0.3 to 3.0 Pa.s at 20° C. and 20 sec-1.

4,556,505

MATERIAL FOR DRYING CUT PLANTS AND GRAINS AND METHODS OF FACILITATING SUCH DRYING

George S. Fenn, Elkton, Oreg., assignor to Fenn & Company, Cottage Grove, Oreg.

Filed Apr. 5, 1982, Ser. No. 363,785

Int. Cl.[4] C09K *3/00, 15/02, 15/06;* A23L *3/03*

U.S. Cl. 252—194 23 Claims

1. In combination for use in a solution for drying cut plants,

a drying agent providing a basic pH of at least 11 in the solution and having properties of becoming at least partially insoluble at a pH no greater than approximately 13.4 in the solution,

a mold inhibiting agent mixed with the drying agent and having properties of remaining inactive in the solution until the occurrence in the solution of conditions inducing molding of the plant and having properties of reacting with moisture under such conditions inducing molding to inhibit such molding, and

a waterproofing agent mixed with the drying agent and the mold inhibiting agent and having properties, at the pH of the drying agent in the solution, for providing for a passage of moisture from the plants while preventing water drops and droplets from being reabsorbed on the plants.

4,556,506

AQUEOUS ELECTROCONDUCTIVE COMPOSITIONS

Hans R. Friedli, Lake Jackson, and Philip Y. Lau, Houston, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Dec. 18, 1984, Ser. No. 682,961
Int. Cl.[4] H01B *1/22*
U.S. Cl. 252—512 9 Claims

1. An aqueous electroconductive coating composition comprising

(A) from about 0.3 to about 15, weight percent of bisphenol A tetramethylene sulfonium zwitterionic mononer;

(B) from about 5 to about 20, percent by weight of polyacrylamide, weight average molecular weight of 200,000 to 500,000, hydrolyzed 6–10% and present as an alkali metal salt;

(C) from about 0.5 to about 20, weight percent of a non-ionic surfactant having an HLB value of from about 11 to about 15;

(D) from about 20 to about 60, percent by weight of metallic particles selected from flakes and powders of Ni, Cu, Al or combinations thereof; and

(E) balance water to provide 100% of total composition by weight.

4,556,507

ELECTRICALLY CONDUCTING MATERIAL AND METHOD OF PREPARING SAME

Shinji Tomibe, Kyoto; Reizo Gomibuchi, Uji, and Kiyofumi Takahashi, Yawata, all of Japan, assignors to Nihon Sanmo Dyeing Co., Ltd., Kyoto, Japan

Filed Jan. 26, 1983, Ser. No. 461,035
Claims priority, application Japan, Dec. 14, 1982, 57-217852
Int. Cl.[4] H01B *1/06*
U.S. Cl. 252—518 7 Claims

1. An electrically conducting material comprising a cyanic group-free polymer or copolymer selected from the group consisting of polyesters, polyamides, polyurethanes, polycarbonates, polyamideimides, polyphenols, polyethers, polyvinylalcohols, polyethylene oxides, wool and polychlal, a first sulfide of at least one first metal selected from the group consisting of copper, cobalt, tin, mercury and lead and a second sulfide of at least one second metal selected from the group consisting of silver, gold and elements of the platinum group, said first and second sulfides being adsorbed on said polymeric material.

4,556,508

ELECTRICALLY CONDUCTING MATERIAL AND PROCESS OF PREPARING SAME

Shinji Tomibe, Kyoto, and Norio Murasaki, Kodaira, both of Japan, assignors to Nihon Sanmo Dyeing Co., Ltd., Kyoto, Japan

Filed Jan. 26, 1983, Ser. No. 461,250
Claims priority, application Japan, Feb. 5, 1982, 57-16264; Dec. 17, 1982, 57-222441
Int. Cl.[4] H01B *1/06*
U.S. Cl. 252—518 8 Claims

1. An electrically conducting material comprising (1) a cyanic group-containing material selected from the group consisting of polymers and copolymers of acrylonitrile, polyamides, polyesters, wool with introduced cyanic radicals, phthalonitrile, isophthalonitrile N-cyanomethylaniline and N-β-cyanoethylaniline and (2) sulfides of copper and at least one auxiliary metal selected from the group consisting of silver, gold and elements of the platinum group, adsorbed on said cyanic group-containing material.

4,556,509

LIGHT DUTY DETERGENTS CONTAINING AN ORGANIC DIAMINE DIACID SALT

Yvon Demangeon, Hardicourt, France, and Alain Jacques, Blegny, Belgium, assignors to Colgate-Palmolive Company, New York, N.Y.

Filed Oct. 9, 1984, Ser. No. 659,197
Int. Cl.[4] C11D *1/40, 3/30*
U.S. Cl. 252—542 11 Claims

1. In a light duty detergent composition containing 5% to 50% by weight of a water-soluble, anionic, organic sulfonate or sulfate detergent, the improvement comprising the inclusion therein of an effective amount of a low molecular weight organic diamine diacid salt selected from the range wherein the mole ratio of mono-anionic detergent to said diacid salt is from 0.8:1 to 9:1 and sufficient to improve salt water foaming and degreasing properties, said acid being selected from the group consisting of hydrochloric, nitric and sulfuric acids.

4,556,510

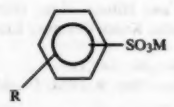
TRANSPARENT LIQUID SHOWER SOAP

Peggy S. Holsopple, Camden County, N.J., assignor to Hercules Incorporated, Wilmington, Del.

Continuation-in-part of Ser. No. 509,749, Jun. 30, 1983, abandoned. This application Jun. 6, 1984, Ser. No. 617,670
Int. Cl.[4] C11D *1/12, 3/37, 17/08*
U.S. Cl. 252—547 14 Claims

1. A liquid soap composition consisting essentially of, in an aqueous medium, by weight of its principal ingredients,

(a) from about 50% to about 90% of an anionic surfactant detergent selected from the group consisting of (i) alkylbenzenesulfonates of the formula:



where R is dodecyl and M is sodium, calcium, triethanolammonium, and isopropylammonium; (ii) alpha-olefinsulfonates of the formula:

R′CH=CHSO$_3$Na

where R′ is 10–18 carbon atoms and mixtures thereof; and (iii) alkyl sulfates of the formula R″OSO$_3$M′ where R″ is lauroyl and M′ is sodium, potassium, ammonium, diethanolammonium, and triethanolammonium;

(b) from about 10% to about 50% of a primary lathering agent selected from the group consisting of (i) dialkyl sulfosuccinates of the formula RO$_2$CCH$_2$CH(SO$_3$Na)CO$_2$R, where R is lauroyl or myristyl, (ii) N-acyl-sarcosinates of the formula R′CON(CH$_3$)CH$_2$CO$_2$Na, where R′CO— is lauroyl and cocoyl, (iii) sodium N-acyl-N-methyltaurates of the formula R″CON(CH$_3$)CH$_2$CH$_2$SO$_3$Na, where R″CO is acyl, (iv) sodium cocoylisothionate, (v) amidopropylbetaines of the formula R‴CONHCH$_2$CH$_2$CH$_2$N$^+$(CH$_3$)$_2$CH$_2$CO$_2$, where R‴CO is cocoyl and lauroyl, and (vi) mixtures thereof;

(c) from about 0.5% to about 15% of a primary water-soluble polymer thickener selected from the group consisting of hydroxyethylcellulose and hydroxypropyl guar as its principal ingredients wherein the total of (a), (b), and (c) is 100% of the principal ingredients; and

(d) water from about 75% to about 88%.

4,556,511
FLAME RESISTANT OIL

Haruo Nishigaki; Koji Watanabe, both of Nagoya; Shiroh Fukui, and Kiyoshi Kanematsu, both of Chiba, all of Japan, assignors to Asahi Glass Co., Ltd. and Mitsubishi Denki Kabushiki Kaisha, both of Tokyo, Japan

Filed Jun. 5, 1984, Ser. No. 617,536
Claims priority, application Japan, Jun. 6, 1983, 58-99486
Int. Cl.[4] C10M *1/32;* H01B *3/46;* H01F *27/10;* H01G *13/04*
U.S. Cl. 252—573 11 Claims

1. A flame resistant oil comprising a fluorine-type oil having a number average molecular weight of from about 300 to about 900 and a miscible silicone oil having a number average molecular weight of from about 160 to about 57,000, wherein the fluorine-type oil and the silicone oil are combined and dissolved in each other with a combination of the respective molecular weights selected from the following combinations I to IV:

I	$300 \leqq X \leqq 900$ $160 \leqq Y < 400$
II	$300 \leqq X \leqq 700 + 0.02Z^2$ $400 \leqq Y < 2{,}000$
III	$300 \leqq X \leqq 600 + 0.02Z^2$ $2{,}000 \leqq Y < 4{,}000$
IV	$300 \leqq X \leqq 500 + 0.02Z^2$ $4{,}000 \leqq Y \leqq 57{,}000$

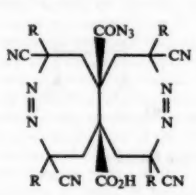
where X is the number average molecular weight of the fluorine-type oil, Y is the number average molecular weight of the silicone oil, and Z is the % by volume of the silicone oil in the flame resistant oil and $10 \leqq Z \leqq 50$.

4,556,512
POLYMERIZATION INITIATOR

Barry D. Dean, Broomall, Pa., assignor to Atlantic Richfield Company, Los Angeles, Calif.

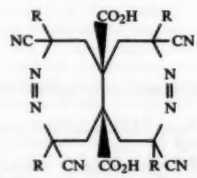
Filed Nov. 5, 1984, Ser. No. 668,059
Int. Cl.[4] C07D *00/00;* C08F *4/04*
U.S. Cl. 260—239 BC 2 Claims

1. A compound having the formula



wherein each R separately represents a methyl or ethyl moiety.

2. A compound having the formula



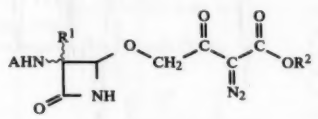
wherein each R separately represents a methyl or ethyl moiety.

4,556,513
PROCESS FOR THE PRODUCTION OF ANTIBIOTIC 1-OXADETHIACEPHALOSPORINS, AND INTERMEDIATE

Seiji Shibahara, Machida; Tsuneo Okonogi, Yokohama; Yasushi Murai, Yokosuka; Shunzo Fukatsu, Ichigayata; Taro Niida, and Tadashi Wakazawa, both of Yokohama, all of Japan, assignors to Meiji Seika Kaisha, Ltd., Tokyo, Japan

Division of Ser. No. 446,534, Dec. 3, 1982, Pat. No. 4,472,576.
This application Aug. 15, 1984, Ser. No. 627,254
Int. Cl.[4] C07D *205/08, 498/04*
U.S. Cl. 260—239 A 1 Claim

1. A diazo compound represented by the formula



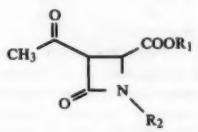
wherein A denotes an acyl group, R^1 denotes a hydrogen atom or a methoxy group and R^2 denotes a carboxy-protecting group selected from the group consisting of alkyl or aralkyl substituents.

4,556,514
4-CARBOXY AZETIDINONE COMPOUNDS AND PRODUCTION THEREOF FROM DIKETENE AND A SCHIFF BASE

Makoto Sunagawa; Koshiro Goda; Masao Enomoto, and Akira Sasaki, all of Osaka, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

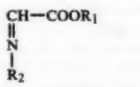
Filed Oct. 13, 1983, Ser. No. 541,648
Claims priority, application Japan, Oct. 13, 1982, 57-180268; Nov. 6, 1982, 57-194894; Jul. 28, 1983, 58-139068
Int. Cl.[4] C07D *205/08*
U.S. Cl. 260—239 A 11 Claims

1. A process for producing an N-protected-3-acetyl-2-azetidinone-4-carboxylic acid ester represented by the formula (II):



(II)

wherein R_1 represents a protecting group for a carboxyl group and R_2 represents a protecting group for a nitrogen atom, which comprises reacting a Schiff base represented by the formula (I):



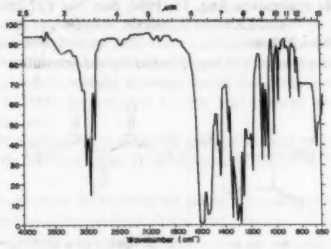
(I)

wherein R_1 and R_2 are as defined above, with diketene in an inert solvent in the presence of an imidazole.

4,556,515
MANUFACTURING PROCESS OF β-ACYLENAMINE

Hisashi Yamamoto, Nagoya, Japan, assignor to Toyo Stauffer Chemical Co., Ltd., Tokyo, Japan

Filed Feb. 28, 1984, Ser. No. 584,357
Claims priority, application Japan, Mar. 9, 1983, 58-38449
Int. Cl.⁴ C07D *237/00, 251/00*
U.S. Cl. 260—239 B 6 Claims



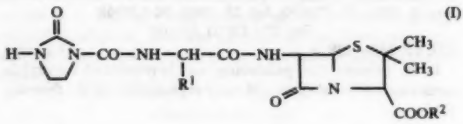
1. A method of making a β-acylenamine comprising condensing an oxime sulfonate with a silyl enol ether in the presence of a reagent.

4,556,516
PROCESS FOR THE PREPARATION OF ACYLUREIDO PENICILLIN DERIVATIVES

Don K. Kim, Seoul, Rep. of Korea, assignor to Boryung Pharmaceutical Co., Ltd., Seoul, Rep. of Korea

Filed Feb. 7, 1984, Ser. No. 577,755
Claims priority, application Rep. of Korea, Dec. 19, 1983, 5991/1983
Int. Cl.⁴ C07D *499/70*
U.S. Cl. 260—239.1 2 Claims

1. A process for preparing acylureido penicillin derivatives having the formula:

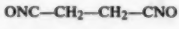


(I)

wherein

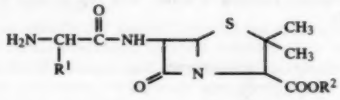
R^1 is phenyl or hydroxyphenyl;

R^2 is a member selected from the group consisting of hydrogen, a protecting group, sodium, potassium and calcium, characterized by reacting ethylenediisocyanate of the formula:



(II)

with penicillin derivatives of the formula:



(VI)

wherein

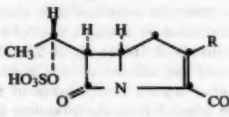
R^1 and R^2 are the same as defined above, in a suitable organic solvent or its aqueous solution under alkaline condition a reaction temperature from −10° C. to reflux temperature.

4,556,517
CARBAPENEM DERIVATIVES

Kentaro Tanaka, Osaka, and Naoki Tsuji, Hyogo, both of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

Filed Sep. 29, 1982, Ser. No. 432,099
Claims priority, application Japan, Dec. 29, 1981, 56-212435; Jan. 20, 1982, 57-8144
Int. Cl.⁴ C07D *487/04;* A61K *31/40*
U.S. Cl. 260—245.2 T 3 Claims

1. A compound of the formula:



wherein R is, dihydroxymethylthio, formylthio or hydroxymethylsulfinyl or a pharmaceutically acceptable salt thereof.

4,556,518
PREPARATION OF 13-CIS RETINOIC ACID

Robert Lucci, Wickoff, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

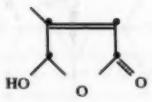
Division of Ser. No. 448,660, Dec. 10, 1982, abandoned. This application Jul. 16, 1984, Ser. No. 631,374
Int. Cl.⁴ C07C *51/353;* C11C *1/00*
U.S. Cl. 260—413 14 Claims

1. A process for producing the 13-cis isomer of the formula:

wherein the Δ indicates the trans configuration about the double bond; and Δ′ indicates the cis configuration about the double bond;

comprising

(a) reacting in a lower alkanol solvent in the presence of an alkali metal hydroxide, a butenolide of the formula:



with a salt of the formula:

wherein R_1, R_2 and R_3 are aryl or di(lower alkyl)amino, and X is halogen;

said reaction being carried out at a temperature of from −10° to −50° C.; and

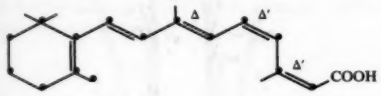
(b) forming said 13-cis isomer by contacting the reaction product of step (a) in an organic solvent medium with a catalyst, said catalyst comprising a triaryl or trialkyl phos-

phine and a compound or chelate of rhodium or palladium other than palladium or rhodium phthalocyanine or a palladium or rhodium compound containing a cyanide ion.

10. A process for preparing the 13-cis isomer of the formula:

wherein the Δ indicates the trans configuration about the double bond; and Δ' indicates the cis configuration about the double bond;

comprising contacting a dicis compound of the formula:



wherein Δ and Δ' is as above in an inert organic solvent medium with a catalyst to form said 13-cis isomer, said catalyst containing a compound or chelate of rhodium or palladium other than palladium or rhodium phthalocyanine or a palladium or rhodium complex or compound containing a cyanide ion and a triaryl or trialkyl phosphine.

4,556,519

PROCESS FOR PRODUCING ACETIC ANHYDRIDE

Tomiya Isshiki, Tokyo; Yasuhiko Kijima; Yuh Miyauchi, both of Chiba, and Takao Kondo, Tokyo, all of Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Continuation-in-part of Ser. No. 396,478, Jul. 8, 1982. This application Jan. 6, 1984, Ser. No. 568,526

Claims priority, application Japan, Jul. 13, 1981, 56-108977; Nov. 6, 1981, 56-177951

Int. Cl.⁴ C07C *51/56*

U.S. Cl. 260—549 **24 Claims**

1. A process for producing acetic anhydride which comprises reacting methyl acetate or dimethyl ether with carbon monoxide at a temperature ranging from 80° to 300° C. and at a partial carbon monoxide pressure ranging from 0.5 to 300 atm. in the presence of a catalyst comprising (a) nickel or a nickel compound and (b) at least one halide selected from the group consisting of bromides, iodides and mixtures thereof, said nickel component being employed in an amount ranging from 1×10^{-4} to 2 g-atom per liter of the reaction solution in terms of metallic nickel and said halide component being employed in an amount ranging from 1×10^{-3} to 15 mol per liter of the reaction solution in terms of halogen atom, together with a co-catalyst comprising a Group IVB metal component and a Group IA metal and/or Group IIA metal component, said Group IVB metal component being one or more materials selected from the group consisting of silicon, germanium and tin belonging to Group IVB of the Periodic Table, compounds of these metals and mixtures thereof, said Group IA metal component being one or more materials selected from the group consisting of lithium, rubidium and cesium belonging to Group IA of the Periodic Table, compounds of these metals and mixtures thereof, and said Group IIA metal component being one or more materials selected from the group consisting of magnesium, calcium, strontium and barium belonging to Group IIA of the Periodic Table, compounds of these metals and mixtures thereof, each of said metal co-catalyst components being employed in an amount ranging from 1×10^{-5} to 30 g-atom per liter of the reaction solution in terms of elementary metal.

4,556,520

2-NITRO(CYANO)PHENYLOXY(THIO)ALKYL PHOSPHINATES OR PHOSPHONATES

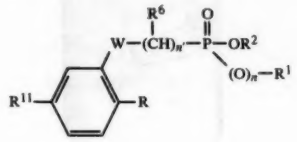
Shy-Fuh Lee, Sunnyvale, and Clive A. Henrick, Palo Alto, both of Calif., assignors to Zoecon Corporation, Palo Alto, Calif.

Division of Ser. No. 433,486, Oct. 8, 1982, Pat. No. 4,456,464, which is a continuation-in-part of Ser. No. 379,587, May 19, 1982, abandoned, which is a continuation-in-part of Ser. No. 317,622, Nov. 2, 1981, abandoned, and a continuation-in-part of Ser. No. 317,623, Nov. 2, 1981, abandoned. This application Apr. 10, 1984, Ser. No. 598,647

Int. Cl.⁴ C07F *9/40, 9/32*

U.S. Cl. 260—951 **3 Claims**

1. A compound of the formula (XIII):



wherein,

W is oxygen or sulfur;

n' is 1, 2 or 3;

n is 0 or 1;

R is nitro, or cyano;

R^1 is lower alkyl;

R^2 is lower alkyl;

R^6 is hydrogen or lower alkyl; and

R^{11} is bromo, chloro or hydroxy.

4,556,521

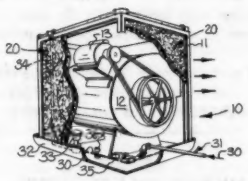
EVAPORATIVE COOLER WITH HIGH LOFT COOLER PAD

Joseph F. Baigas, Jr., Waco, Tex., assignor to Hobbs Bonded Fibers, Groesbeck, Tex.

Filed May 31, 1983, Ser. No. 499,359

Int. Cl.⁴ B01F *3/04*

U.S. Cl. 261—94 **13 Claims**



6. An evaporative cooler pad comprising a high loft body of randomly oriented synthetic fibers, said fibers being separated from one another along the greater part of their respective lengths, forming interconnecting interstices and passageways throughout the body such that air directed toward the pad may flow generally freely therethrough in all directions,

said pad also comprising a preformed hydrophilic foam which substantially coats and bonds the synthetic fibers of the body and which also bridges and spans random portions of the interstices and passageways therethrough to substantially increase the available surface area of the pad for contact by water with air flowing therethrough, said preformed foam and its surface having a minute cellular structure serving as means for producing a capillary type effect when contacted by water whereby the pad upon

being contacted by water wicks the water along its foam areas to thereby optimize the relative cooling efficiency of the pad.

4,556,522

SIEVE TYPE DISTILLATION TRAY WITH CURVED BAFFLES

Keith B. Wilson, Allentown, Pa., assignor to Air Products and Chemicals, Inc., Allentown, Pa.

Filed May 9, 1984, Ser. No. 608,586

Int. Cl.[4] B01F *3/04*

U.S. Cl. 261—114 R **5 Claims**

1. In a fractionation column comprising circular edged liquid-gas containing trays of the sieve type which are suited for effecting intimate contact between rising vapor and liquid flowing across the trays from an inlet to an outlet and the liquid flowing downwards in a generally helical pathway in said column, the improvement which comprises

a plurality of segment zones on said trays, each segment zone substantially isolated from liquid contact with the other, the segment zones having a liquid inlet end weir and a liquid outlet end weir which are substantially parallel to each other;

a plurality of baffles within each of said segment zones, said baffles extending vertically from the floor of said trays and defining a generally arcuate liquid pathway from one end weir portion to another, said baffles being spaced apart from each other at substantially equal distances thereby defining a multiplicity of liquid flow paths within smaller segment stages with substantially the same cross sectional area between the end weir portions of each segment zone; and

a plurality of perforations in the floor of the trays uniformly distributed within each segment zone to permit passage of vapor through the trays for contact with the liquid.

4,556,523

MICROBUBBLE INJECTOR

Yves Lecoffre, Domene, and Jean Marcoz, Grenoble, both of France, assignors to Alsthom-Atlantique, Paris, France

Filed Aug. 9, 1984, Ser. No. 638,930

Claims priority, application France, Aug. 9, 1983, 83 13081

Int. Cl.[4] B01F *3/04*

U.S. Cl. 261—123 **7 Claims**

1. Microbubble injector comprising:

a liquid source adapted to supply at a first pressure a liquid in which at least one gas is dissolved and which is able to vaporize at ambient temperature at a second pressure lower than said first pressure,

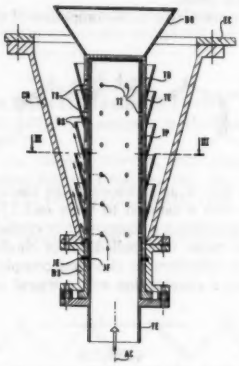
a chamber containing a liquid mass at a third pressure which is lower than said first pressure but higher than said second pressure,

an injector wall,

at least one injector hole in said injector wall through which said liquid is caused to flow at high speed into said chamber, and

a deflector in said chamber facing said at least one injector hole and substantially parallel to and spaced from said injector wall so as to form a divergent passage for said liquid, whereby said liquid is caused to flow radially away from said at least one injector hole and vapor is caused to form in a cavitation pocket starting substantially at the edge of said at least one injector hole and the pressure of said liquid is caused to increase rapidly downflow of said pocket by virtue of the rapidly and progressively increasing cross-section of said divergent passage,

said at least one injector hole being substantially circular and the distance between said injector wall and said deflector at the edge of said at least one injector hole being less than one quarter of the diameter of said at least one injector hole, whereby the flow velocity of said injected liquid is



maximum in the vicinity of said edge when the flow is radial,

and wherein said injector further comprises:

an inlet tube receiving said liquid under pressure from said source and comprising a circular cylindrical wall with a central axis, the cylindrical wall of said tube constituting said injector wall and said at least one injector hole comprising a plurality of injector holes within said cylindrical wall of said tube, distributed over its surface,

and a deflector tube disposed coaxially around said inlet tube to define an annular passage, constituting said deflector and being formed with a plurality of outlet holes distributed over its surface to permit liquid injected into said passage to escape therefrom, said outlet holes being spaced from said injector holes and together providing a total liquid outlet cross-section which is a multiple of the total cross-section of liquid flow in said passage around said injector holes.

4,556,524

METHOD FOR PREPARING DIGITAL STORAGE DEVICE BY LASER APPLICATION

Anthony G. Cullis, Worcester; Hugh C. Webber, and Nigel G. Chew, both of Malvern, all of England, assignors to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, United Kingdom

Filed Sep. 30, 1982, Ser. No. 430,382

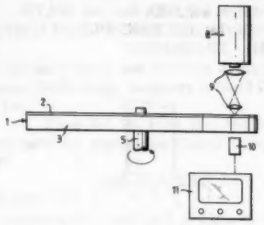
Claims priority, application United Kingdom, Nov. 10, 1981, 8133925

Int. Cl.[4] B05D *3/06*

U.S. Cl. 264—1.2 **7 Claims**

1. A method of making a digital storage device by selectively irradiating a crystalline or polycrystalline silicon sub-

strate with laser radiation to form uniform amorphous regions in the surface of the substrate representing logic one and zero states, the laser radiation being of a wavelength less than 400 nanometers, applied for a time between 0.1 and 10 nanosec-



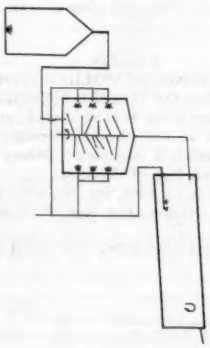
onds, with an energy density in the range of 0.1 to 0.8 J/cm^2 so that most of the radiation is absorbed in the top approximately 3000 Å of the substrate which rapidly melts and rapidly freezes into an amorphous state.

4,556,525

METHOD FOR PRODUCING GRANULATE SODIUM TRIPOLYPHOSPHATE OF LOW BULK DENSITY

Hans A. L. Berglund, Helsingborg, Sweden, assignor to Boliden Aktiebolag, Stockholm, Sweden

Filed May 8, 1984, Ser. No. 608,098
Claims priority, application Sweden, May 25, 1983, 8302943
Int. Cl.[4] B29C *23/00*
U.S. Cl. 264—8 **10 Claims**



1. A method for producing low bulk density granulate sodium tripolyphosphate comprising:

(a) forming a moistened powderous sodium-phosphate mixture by adding water to uncalcined sodium-phosphate powder in a mixer;

(b) introducing the moistened mixture into a calcining furnace;

(c) adding additional water to the moistened mixture in the calcining furnace in the vicinity of introduction of the mixture; and

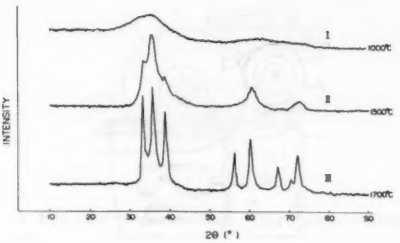
(d) calcining the mixture to form low bulk density sodium tripolyphosphate granules.

4,556,526

PROCESS FOR PRODUCTION OF SINTERED CERAMIC BODY

Seishi Yajima; Kiyohito Okamura; Yoshio Hasegawa, and Takemi Yamamura, all of Oharai, Japan, assignors to UBE Industries, Ltd., Yamaguchi, Japan

Filed Mar. 20, 1981, Ser. No. 245,849
Claims priority, application Japan, Mar. 25, 1980, 55-36892; Mar. 25, 1980, 55-36893; Dec. 25, 1980, 55-182816
Int. Cl.[4] C04B *35/52*
U.S. Cl. 264—60 **9 Claims**



1. A process for producing a sintered ceramic body, which comprises heating a semi-inorganic block copolymer at a temperature of from 500° to 2300° C. in vacuum or in an atmosphere composed of at least one gas selected from the group consisting of inert gases, reducing gases and hydrocarbon gases, and shaping the heated product, and simultaneously with, or after, the shaping of the heated product, sintering the shaped product at a temperature of from 800° C. to 2300° C. in vacuum or in an atmosphere composed of a least one gas selected from the group consisting of inert gases, reducing gases and hydrocarbon gases, wherein said semi-inorganic block copolymer is an organometallic copolymer having a number average molecular weight of about 1000 to about 50000 and composed of crosslinked polycarbosilane blocks and polyzirconosiloxane blocks, which is obtained by mixing

(1) polycarbosilane with a number average molecular weight of about 500 to about 10000 having a main chain skeleton composed mainly of carbosilane units of the formula (Si—CH_2), each silicon atom of the carbosilane units substantially having bonded thereto a side-chain group selected from the class consisting of hydrogen, lower alkyl and phenyl, with

(2) polyzirconosiloxane with a number average molecular weight of about 500 to 10000 having a main chain skeleton composed mainly of zirconoxane units of the formula (Zr—O) and siloxane units of the formula (Si—O), most of the zirconium atoms of said zirconoxane units having bonded thereto a side-chain group selected from the class consisting of lower alkoxy, phenoxy and acetyl-acetoxy, most of the silicon atoms of said siloxane units having bonded thereto a side-chain group selected from the class consisting of lower alkyl and phenyl, and the ratio of the total number of said zirconoxane units to that of said siloxane units being in the range of about 30:1 to about 1:30, in such mixing proportions that the ratio of the total number of said carbosilane units to the sum of the total number of said zirconoxane units and the total number of said siloxane units is in the range of about 100:1 to about 1:100; and heating the resulting mixture in an organic solvent in an atmosphere inert to the reaction to bond at least one of the silicon atoms of said polycarbosilane with at least one of the zirconium atoms and/or silicon atoms of said polyzirconosiloxane through an oxygen atom.

4,556,527

METHOD AND APPARATUS FOR MAKING PLASTICS-COATED SANITARY WEBS OF PAPER

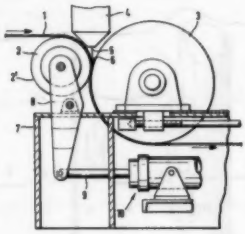
Uwe Sarcander, Lengerich, Fed. Rep. of Germany, assignor to Windmoller & Holscher, Lengerich, Fed. Rep. of Germany

Filed Sep. 29, 1983, Ser. No. 536,983

Claims priority, application Fed. Rep. of Germany, Oct. 1, 1982, 3236459

Int. Cl.[4] B29D *7/22*

U.S. Cl. 264—171 3 Claims



1. Apparatus for making plastics-coated sanitary webs of paper, said apparatus comprising:

a roller frame;

embossing roller means including a cooled, hard surface defining a relief pattern;

backing roller means including a smooth cylindrical surface of elastic material, said embossing roller means and said backing roller means being mounted on said roller frame pressing against one another with an embossing pressure and defining a nip therebetween;

means for feeding a paper web onto said backing roller means and through said nip for elastically supporting said paper web;

nozzle means mounted above said nip for extruding a plastics film onto a surface of said paper web opposite to a surface of said paper web elastically supported on said backing roller means; and

a height of said relief pattern of the embossing roller means substantially corresponding to a thickness of the paper web plus a thickness of the extruded plastics film, a surface of the embossing roller forming a base of the relief pattern presses the plastics film with said embossing pressure against the paper web that is supported on the backing roller means and the paper web and the extruded plastics film adhere to each other over their full surface.

3. A method of making sanitary webs of hygienic paper from a web of paper and an extruded plastics film using an embossing roller including a cooled steel or like surface defining a relief pattern and a backing roller including a smooth cylindrical surface of elastic material, said embossing roller and said backing roller defining a nip therebetween, said method comprising;

feeding a length of said paper web onto said backing roller;

extruding a plastics film onto a surface of said paper web opposite to a surface contacting said backing roller;

feeding said paper web and said extruded plastics film to said nip;

pressing said extruded plastics film by said embossing roller against said paper web in said nip;

embossing said relief pattern onto said extruded plastics film; and

adhering a full surface of said paper web to a full surface of said extruded plastics film by said embossing.

4,556,528

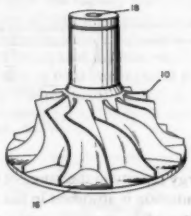
MOLD AND METHOD FOR CASTING OF FRAGILE AND COMPLEX SHAPES

Herbert M. Gersch, Torrance, and Glenn W. Brown, Rancho Palos Verdes, both of Calif., assignors to The Garrett Corporation, Los Angeles, Calif.

Filed Jun. 16, 1983, Ser. No. 504,778

Int. Cl.[4] B29C *1/02*

U.S. Cl. 264—221 20 Claims



1. A method of casting articles comprising the steps of:

providing a pattern of the shape to be cast;

forming a mold about the pattern having an inner and an outer layer of a first and a second wax, said first wax having a melting temperature greater than said second wax;

extracting the pattern from the mold, thereby forming an impression of the pattern in the inner layer of the mold;

removing the outer layer of wax;

pouring a slip into the impression in the mold;

allowing the slip to solidify while in the mold; and removing the inner layer of wax.

20. A mold used to produce fragile/complex shapes comprising:

an inner layer of a polyethelene glycol based wax which defines the shape of the article to be made and

an outer layer of a paraffin based wax, the melting temperature of the inner layer of wax being greater than the melting temperature of the outer layer of wax.

4,556,529

METHOD FOR BONDING MOLDED COMPONENTS SHEETING OR SHAPED MEMBERS

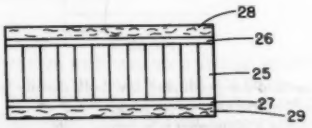
Dieter Muser; Norbert Raab, both of Munich, and Johann Deger, Viehbach, all of Fed. Rep. of Germany, assignors to M.A.N. Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed May 11, 1984, Ser. No. 609,150

Claims priority, application Fed. Rep. of Germany, May 11, 1983, 3317138

Int. Cl.[4] B29D *3/02;* B29G *7/00;* B32B *31/12*

U.S. Cl. 264—258 1 Claim



1. A method for bonding prefinished molded components of a non-hardened, uncured synthetic resin and filler material to members having a honeycomb or coarsely porous shape, comprising interposing at least one layer of fabric between the prefinished molded component and the member, and placing the prefinished molded component, fabric layer and member into a mold for curing and hardening and bonding to each other at the processing pressure and temperature of the molded component, wherein the at least one layer of fabric produces a

good bond between the prefinished molded component and member while substantially preventing the resin from flowing from the bonding locations into the honeycomb or pores of the member.

4,556,530

METHOD FOR PRODUCING A VERY THIN DENSE MEMBRANE

Albert van der Scheer, and Marinus J. Reynhout, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Jul. 26, 1984, Ser. No. 634,848

Claims priority, application United Kingdom, Aug. 2, 1983, 8320797

Int. Cl.⁴ B29D *7/02*

U.S. Cl. 264—298 **13 Claims**

1. A process for producing a very thin, dense membrane which comprises (1) preparing a solution of a base polymer or a base prepolymer and a substantially water insoluble surface active agent in an organic liquid, (2) allowing the solution to spread spontaneously on the surface of a liquid support substantially consisting of a polar fluid and allowing the solution to desolvate and to react, if a prepolymer is present, thereby effecting the formation of a very thin dense membrane comprising said polymer and said water insoluble surface active agent.

4,556,531

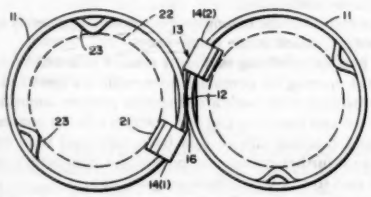
NUCLEAR FUEL ASSEMBLY SPACER AND SPRING COMPONENT THEREFOR

Michael V. Curulla, San Jose, Calif., assignor to General Electric Company, San Jose, Calif.

Filed Apr. 19, 1983, Ser. No. 486,525

Int. Cl.⁴ G21C *3/34*

U.S. Cl. 376—441 **7 Claims**



1. In a fuel assembly for a nuclear reactor including a plurality of elongated elements and a spacer for retaining said elements in lateral position comprising an array of laterally positioned, cojoined tubular ferrules wherein each of said ferrules provides a passage for one of said elements extending therethrough: a spring component for said spacer having a generally H-shape including a pair of spaced apart, side-by-side, spring members of generally hairpin-like configuration, each said spring member having an arched side, said arched sides extending in an opposite direction relative to said arched side of the other spring member, the adjacent edges of said spring members being connected by retaining strap, said spring members extend in a substantially vertical direction, each of said spring members being fitted on the wall of one of a pair of adjacent ferrules whereby an arched side of one said spring members projects into one of said pair of adjacent ferrules and an arched side of the other of said spring members projects into the other of said pair of adjacent ferrules for resilient engagement with the elongated elements extending through said ferrules, said retaining strap being fitten into facing recesses formed in the adjacent walls of said pair of adjacent ferrules, said retaining strap remains outside of the inner surface of said adjacent walls of said pair of adjacent ferrules.

4,556,532

METHOD FOR MANUFACTURING CAMSHAFT

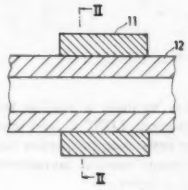
Genkichi Umeha, Tokyo; Shigeru Urano, Omiya, and Satoru Kato, Kawaguchi, all of Japan, assignors to Nippon Piston Ring Co., Ltd., Tokyo, Japan

Filed Jan. 10, 1985, Ser. No. 690,231

Claims priority, application Japan, Feb. 7, 1984, 59-19400; Apr. 14, 1984, 59-73884

Int. Cl.⁴ B22F *5/06*

U.S. Cl. 419—5 **6 Claims**



1. A method for manufacturing a camshaft comprising of the steps:

shaping a green compact of each fitting member with a bore for fitting engagement with a stem from a solid-phase sintering material having a composition of an Fe-C-Cu system which contains 17–35% by weight of Cu;

fitting said green compact on said stem; and

sintering said green compact fitted on said stem in a furnace, whereby said Cu melts out of said green compact and penetrates a clearance between said stem and said green compact as a binder therebetween.

4,556,533

WEAR-RESISTANT SINTERED FERROUS ALLOY AND METHOD OF PRODUCING SAME

Takaaki Oaku, Yokosuka; Masahiko Shioda, Yokohama; Syunsuke Suzuki, Tokyo, and Yoshihiro Maki, Miura, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Nov. 30, 1983, Ser. No. 556,605

Claims priority, application Japan, Dec. 2, 1982, 57-211962

Int. Cl.⁴ B22F *3/16*

U.S. Cl. 419—11 **3 Claims**

1. A method of producing a wear-resistant sintered ferrous alloy, comprising the steps of:

(i) preparing 100 parts by weight of a powder mixture by mixing (a) 5 to 35 parts by weight of a powder of a Fe-Cr-B-Si alloy which contains 10 to 35% by weight of Cr, 1.0 to 2.5% by weight of B and 0.5 to 3.0% by weight of Si, (b) such an amount of a Cu-P alloy powder that the prepared powder mixture contains 0.2 to 1.5% by weight of P and 1.0 to 20.0% by weight of Cu, and (c) the balance of a powder of a cast iron such that said powder mixture contains 1.0 to 2.5% weight of Si and 1.0 to 3.5% by weight of C;

(ii) compacting said powder mixture into a body of a desired shape; and

(iii) sintering said body in a nonoxidizing atmosphere at a temperature in the range from about 950° C. to about 1100° C. to produce a wear-resistant ferrous alloy having a reduced tendency to abrade metals in frictional contact therewith.

4,556,534
NICKEL BASED CASTING ALLOY

Arthur P. Burnett, and Wayne C. Bollinger, both of York, Pa., assignors to Dentsply Research & Development Corp., Milford, Del.

Filed Dec. 20, 1983, Ser. No. 563,556
Int. Cl.[4] C22C *19/05*
U.S. Cl. 420—445 **14 Claims**

5. A nickel base casting alloy consisting essentially of by weight percent about:

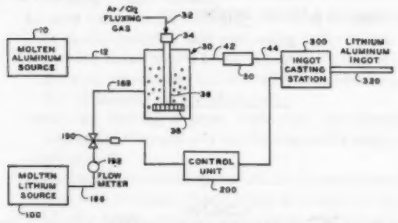
Ni: 65–84
Cr: 11–16
(Cb)Nb: 3.5–5.5
Mn: 3.5–4.5
Be: 0.85–1.15
Al: 0.8–2.5

wherein said alloy exhibits a solidus temperature between about 1,050° C. to about 1,070° C. and tensile strength, ductility, and corrosion resistance properties suitable for use in the fabrication of gypsum bonded investment cast dental prosthetic devices and jewelry.

4,556,535
PRODUCTION OF ALUMINUM-LITHIUM ALLOY BY CONTINUOUS ADDITION OF LITHIUM TO MOLTEN ALUMINUM STREAM

Kenneth A. Bowman, Apollo; John E. Jacoby, Murrysville, and Kellen M. Finn, Delmont, all of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Jul. 23, 1984, Ser. No. 633,616
Int. Cl.[4] C22C *21/00*
U.S. Cl. 420—580 **12 Claims**



1. An improved process for forming aluminum-lithium alloys which comprises continuously adding a measured amount of molten lithium to a molten aluminum stream flowing to an ingot casting mold wherein the predetermined physical quantities of aluminum-lithium alloy density and the ingot casting mold cross-sectional area are used together with the instantaneously and continuously monitored ingot casting rate to determine the amount of lithium to be added to said molten aluminum stream to thereby produce an aluminum-lithium alloy ingot with minimal composition variation with respect to lithium along the length of the ingot.

4,556,536
METHOD AND COMPOSITION FOR CORROSION INHIBITION OF CARBON STEEL BY AMMONIUM SULFATE

Joseph Novotny, Baton Rouge, La., assignor to Allied Corporation, Morris Township, Morris County, N.J.

Filed Jun. 30, 1980, Ser. No. 164,486
Int. Cl.[4] C23F *11/00*
U.S. Cl. 422—7 **8 Claims**

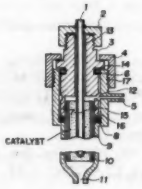
1. In an aqueous ammonium sulfate fertilizer solution in contact with carbon steel, the improvement which comprises at least about 0.1 to about 5% by weight of a carbon steel corrosion inhibitor selected from the group consisting of ammonium polyphosphate, ammonium thiosulfate, sodium thiosulfate, potassium thiosulfate, potassium nitrite and sodium nitrite.

5. A process for inhibiting carbon steel corrosion by an aqueous ammonium sulfate fertilizer solution comprising adding to said solution from about 0.1% to about 5.0% ammonium polyphosphate, sodium nitrite or potassium nitrite.

4,556,537
REACTOR

Junji Honma, Tokyo, Japan, assignor to Idemitsu Kosan Company Limited, Japan

Filed Oct. 11, 1983, Ser. No. 540,670
Claims priority, application Japan, Oct. 15, 1982, 57-180943; Oct. 21, 1982, 57-183748
Int. Cl.[4] B01J *8/06*
U.S. Cl. 422—49 **4 Claims**



1. A reactor comprising:

an inner reaction tube having an inner space, open ends and a catalyst packed in the inner space;

a head part for receiving said inner reactor tube and having an inlet opening for communication with one open end of said reaction tube, with a connection portion connected between said head part and said reaction tube for connecting said reaction tube to said head part, said head part having a further connection portion for connecting said head part to an outer cylindrical part; and

an outer cylindrical part for receiving said head part and for connection to said head part by said further connection portion, said outer cylindrical part having a connecting portion including fastening means located on the outside surface of the upper end of the outer cylindrical part where said outer cylindrical part is connected to said head part by means disconnectably connected to said fastening means on the outer cylindrical part, said outer cylindrical part having a space therein accommodating said inner reaction tube, an inlet connection positioned for coupling to said inlet opening of said head part, said outer cylindrical part also having an outlet connection in communication with the other open end of said inner reaction tube whereby fluid can pass through said inlet connection through said inlet opening and into said one end of said reaction tube, through said catalyst in said reaction tube and out said other end of said reaction tube through said outlet connection;

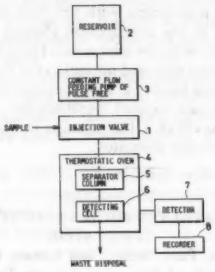
whereby said head part is disconnectably connected to said outer cylindrical part and the inner reaction tube placed in said outer cylindrical part so that said head part can be disconnected and removed along with said inner reaction tube from said outer cylindrical part without disturbing said inlet connection and said outlet connection.

4,556,538

CHROMATOGRAPHIC APPARATUS

Susumu Matsushita, Shinnanyo; Yoshimitsu Tada, Tokuyama; Tetsuo Ikushige, Yamaguchi, and Nobuyuki Baba, Atsugi, all of Japan, assignors to Toyo Soda Manufacturing Co., Inc., Japan

Filed Mar. 24, 1982, Ser. No. 361,423
Claims priority, application Japan, Mar. 27, 1981, 56-44094
Int. Cl.[4] G01N *31/08*
U.S. Cl. 422—70 **1 Claim**



1. A chromatographic analytical apparatus comprising:

1. A column from 20 to 90 mm in length for separation of the components of an aqueous sample solution, said column containing a spherical porous barrier comprising an ion exchange gel having particle size of 1 to 8 μm, a pore size less than 1000 A, an ion exchange capacity of 0.03 to 1.0 milliequivalents/g and a mechanical strength greater than 200 kg/cm^2,
2. a detecting cell having a cell capacity less than 1.9 μl for detecting eluates from the separating column,
3. a detector operatively connected to the detecting cell, and
4. a constant flow, pulse free feeding pump for feeding an eluting solution to the separating column, said column, detector and pump being operatively connected, said separating column and detecting cell arranged in a thermostatic oven.

4,556,539

DISC-PLAYING AROMA GENERATOR

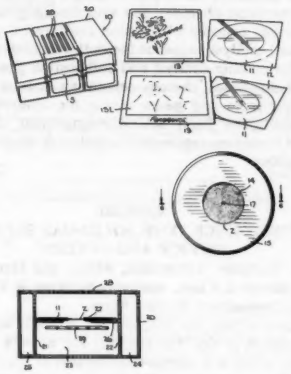
Donald Spector, 380 Mountain Rd., Union City, N.J. 07087

Continuation-in-part of Ser. No. 412,080, Aug. 27, 1982. This application Mar. 21, 1983, Ser. No. 477,353
The portion of the term of this patent subsequent to Aug. 24, 1999, has been disclaimed.
Int. Cl.[4] A61L *9/03*
U.S. Cl. 422—125 **4 Claims**

1. A disc-playing aroma generator kit comprising:

A. a replaceable aromatic disc constituted by a circular sheet of absorbent material having good wicking properties impregnated with a liquid fragrance and sandwiched between a pair of annular films, the outer periphery of which extend beyond the outer periphery of said sheet, and which are impervious to said liquid fragrance, said annular films are joined at their outer periphery to provide a liquid impermeable seal there at and to create a central zone exposing the central region of said sheet, whereby said disc simulates the appearance of a conventional phono disc record;

B. a disc player having a case provided with a vented top wall, side walls, a bottom wall, a front wall having a disc receiving slot therein, a horizontal ledge intermediate to said bottom wall and said vented top wall and in alignment with said slot, said ledge having an opening therein which registers with said exposed central region of a received disc, said ledge and a received disc dividing the case to form a heating chamber therebelow so that when a disc is received in said slot a confined air region is created in said heating chamber, and a heater disposed in said heating chamber to heat and expand the air therein whereby the resultant positive air pressure forces the heated air through the central region of the sheet to volatilize the liquid fragrance impregnant therein and to produce an aromatic vapor that is discharged into the atmosphere through said vented top wall, the liquid fragrance volatilized from said central region being replenished by liquid fragrance wicked from the remaining region of said sheet surrounding the central region thereof which serves as a liquid reservoir.

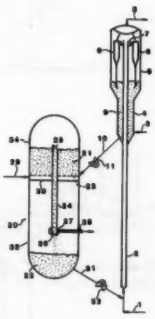


4,556,540

SEPARATION OF REGENERATED CATALYST FROM COMBUSTION PRODUCTS

Roger M. Benslay, Catlettsburg, Ky., assignor to Ashland Oil, Inc., Ashland, Ky.

Division of Ser. No. 378,578, May 17, 1982, Pat. No. 4,477,335. This application Aug. 15, 1983, Ser. No. 523,816
Int. Cl.[4] B01J *8/24, 8/28*
U.S. Cl. 422—142 **18 Claims**



1. Apparatus for regenerating coke-bearing, spent fluidizable catalyst comprising: a vessel; an essentially gas impermeable horizontal partition disposed within said vessel, extending throughout the cross-section of the vessel at the position of the partition and dividing said vessel into an upper regeneration chamber and a lower disengagement chamber, said regeneration chamber having means defining upper and lower zones within said regeneration chamber; spent catalyst inlet means in said upper regeneration chamber of the vessel; regeneration

gas supply means within the lower zone of said regeneration chamber for fluidizing a bed of spent catalyst; an elongated, tubular conduit disposed within said vessel, extending from said upper zone in said regeneration chamber through said partition and into said disengagement chamber and having an inlet end in said upper zone of said regeneration chamber and an outlet section having an open downstream end in said disengagement chamber, thereby providing a passageway between said regeneration chamber and said disengagement chamber for cocurrent transfer of gaseous combustion products and regenerated catalyst; means at the outlet section of said tubular conduit for causing catalyst and combustion gases to move in divergent directions, thereby separating at least a portion of the catalyst from said gases; means for removing separated combustion gases from said disengagement chamber; and means for removing regenerated catalyst from said disengagement chamber.

4,556,541

LOW RESIDENCE TIME SOLID-GAS SEPARATION DEVICE AND SYSTEM

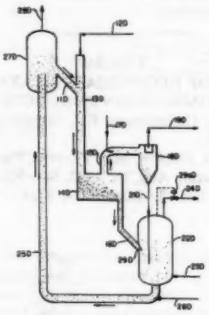
Robert J. Gartside, Auburndale, Mass., and Herman N. Woebcke, Stamford, Conn., assignors to Stone & Webster Engineering Corporation, Boston, Mass.

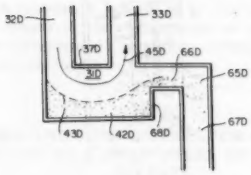
Division of Ser. No. 394,107, Jul. 1, 1982, which is a continuation of Ser. No. 165,781, Jul. 6, 1979, Pat. No. 4,348,364, which is a continuation-in-part of Ser. No. 55,148, Jul. 6, 1979, Pat. No. 4,288,235. This application Feb. 24, 1984, Ser. No. 583,134

The portion of the term of this patent subsequent to Feb. 8, 2001, has been disclaimed.

Int. Cl.[4] B01J *8/08*

U.S. Cl. 422—145 **5 Claims**





1. In a TRC apparatus having a tubular thermal cracking reactor including a reaction chamber cracking zone, means for delivering hot inert particulate solids to the reactor, means for delivering hydrocarbon feed or hydrodesulfurized residual oil fluid feed to the reactor and means for delivering a diluent gas at a temperature between 1300° F. and 2500° F. to the reactor and wherein the hydrocarbon fluid feed or the hydrodesulfurized residual oil fluid feed along with the inert particulate solids and diluent gas are passed through the cracking zone for a residence time of 0.05 to 2 seconds, the improvement comprising a solids-gas separator designed to effect rapid removal of particulate solids from a dilute mixed phase stream of solids and gas, said separator comprising a chamber for disengaging solids from the incoming mixed phase stream, said chamber having rectilinear or slightly arcuate longitudinal walls to form a flow path essentially rectangular in cross section, said chamber also having a mixed phase inlet means, a gas phase outlet means located between the mixed phase inlet means and solids outlet means, and a solids phase outlet means, having a first section which is of smaller cross-sectional area than said chamber and which is collinear with the flow path and a second section normal to the first section aligned for downflow of solids by gravity, with the inlet means being located at one end of the chamber and disposed normal to the flow path, the solids outlet means being located at the other end of the chamber, and the gas outlet means located therebetween oriented in such a manner so as to effect a 180° change in direction of the gas within said solids-gas separator.

4,556,542

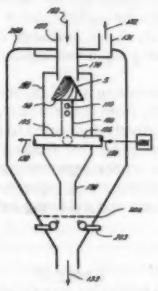
FCCU CATALYST-HIGH VELOCITY VAPOR SEPARATOR

Scott M. Sayles, Port Neches, and Leonce F. Castagnos, Jr., Nederland, both of Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Jun. 4, 1984, Ser. No. 616,639

Int. Cl.[4] B01J *8/18;* B01D *45/12*

U.S. Cl. 422—147 **2 Claims**



1. In a fluid catalytic cracking apparatus a separator apparatus for rapidly disengaging and separating catalyst and catalyst fines from cracked product vapor discharged from a down flow reaction zone in the fluid catalytic cracking apparatus, the separator apparatus comprising:

(1) a static, spin inducing outward flow diverter consisting of a right circular conical member with a base comprising:

(a) a frustum into which are positioned adjoining equispaced spiral channels extending from the apex of the frustum to the intersection of the frustum with the base, which spiral channels impose a spin and outward direction on the high velocity flow stream impinging thereon, the channels being sufficiently deep to contain a layer of catalyst at least one centimeter deep which layer of catalyst protects the diverter from direct, high velocity impingement by catalyst particles in the flowing stream, and in the channels, barriers which retard the flow of catalyst along the channels,

(b) an apex angle of the frustum being less than the angle of repose of the catalyst particles impinging on the frustum, thereby deflecting the flowing vapors at obtuse angles to the normal while reducing the momentum of the impinging catalyst particles by impact on the layer of catalyst and thereby reducing the velocity of impinging catalyst particles below that of the flowing vapor,

(2) a position member attached to the base in which position

member are apertures through which the vapor and catalyst fines pass to a bore,

(3) support members which support the position member and in which is the continuation of the bore for passage of vapor and catalyst fines therethrough,

(4) cyclone separators in flow communication with the bore which receive vapor and catalyst fines from the bore in support members and which cyclone separators separate vapor from catalyst fines,

(5) tubular means in flow communication with the reaction zone which by proximity directs the entire high velocity flow stream toward the frustum at right angles to the plane of the base, and of radius less than or equal to the radius of the base,

(6) a cylindrical separation chamber attached to the tubular means and in which is positioned the static, spin inducing outward flow diverter, the position member and the support members and in which catalyst looses additional momentum,

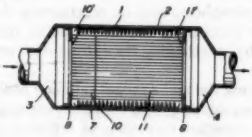
(7) a dip leg in flow communication with the separation chamber for gravitationally transporting catalyst from the separation chamber to a stripper vessel of the fluid catalytic cracking apparatus.

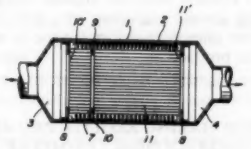
4,556,543

CERAMIC HONEYCOMB CATALYTIC CONVERTERS HAVING HIGH THERMAL SHOCK RESISTANCE

Shigeru Mochida, Kasugai; Masaru Kojima, and Jun Kitagawa, both of Nagoya, all of Japan, assignors to NGK Insulators, Ltd., Japan

Continuation of Ser. No. 284,589, Jul. 17, 1981, abandoned. This application Jul. 27, 1983, Ser. No. 517,386
Claims priority, application Japan, Jul. 24, 1980, 55-100484
Int. Cl.[4] F01N *3/22, 3/28, 7/16*
U.S. Cl. 422—171 **6 Claims**





1. A thermal shock resistant ceramic honeycomb catalytic converter having a plurality of catalytic, serially disposed ceramic honeycomb structural bodies with a large number of parallel channels separated by thin walls, said plurality of bodies being positioned in a catalytic converter chamber such that at least one heat resistant ceramic honeycomb structural body selected from the group consisting of alumina, mullite, zirconia, zircon, spinel, alumina titanate, silicon carbide and silicon nitride, having a dimension

$$0.1 \leqq L/D \leqq 0.40$$

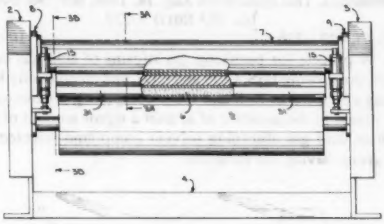
wherein L and D are a length and a diameter of the ceramic honeycomb structural body, respectively, is located upstream of all the remaining ceramic honeycomb structural bodies and imparts increased thermal shock resistance to the catalytic converter.

4,556,544

RETRACT MECHANISM FOR CORONA TREATER STATION

Andreas Ahlbrandt, 17 Uhlandstrasse, Lauterbach, Fed. Rep. of Germany

Filed May 17, 1984, Ser. No. 611,472
Int. Cl.[4] B01J *19/08;* **C21D** *1/09*
U.S. Cl. 422—186.04 **7 Claims**



1. In a treater station which includes a roller electrode supported between a pair of spaced side assemblies and an active electrode supported adjacent the roller electrode by a header which extends between the pair of spaced side assemblies, the improvement therein which comprises:

a pair of carriages connected to respective ends of the header and slidably connected to the respective side assemblies, the carriages being slidable between a treatment position in which the active electrode supported by the header is positioned close to the roller electrode and a threading position in which the active electrode is spaced radially outward from its treatment position; and

cam means connected to respective side assemblies and being operable to translate rotational motion of the header into a sliding motion which moves the carriages between their treatment and threading positions; and

whereby the active electrode is withdrawn from its treatment position to its threading position when the header is rotated in either direction to thereby enable the active electrode to be swung clear of the roller electrode.

4,556,545

METHOD FOR CONDITIONING PHOSPHATE ORES

Subrahmanyam Cheruvu, Mercerville, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Sep. 5, 1984, Ser. No. 647,503
Int. Cl.[4] C01F *1/00, 5/00;* **C01B** *25/16;* **B03D** *1/14*
U.S. Cl. 423—167 **25 Claims**

1. A process of conditioning a phosphate-containing ore with a hydrocarbon oil and at least one fatty acid comprising the steps of:

(a) preparing a solution of at least one fatty acid in water containing an alkaline agent;

(b) combining the solution of step (a) with at least a portion of the hydrocarbon oil to form a substantially stable, substantially homogeneous emulsion; and

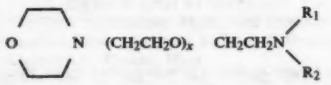
(c) introducing the emulsion into the conditioning step wherein it is combined with the phosphate-containing ore and with the remainder of the hydrocarbon oil.

4,556,546
BIS TERTIARY AMINO ALKYL DERIVATIVES AS SOLVENTS FOR ACID GAS REMOVAL FROM GAS STREAMS

William F. Burgoyne, Jr., Allentown; Michael S. Chen, Zionsville; Dale D. Dixon, Kutztown, and Thomas J. Edwards, Allentown, all of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Continuation-in-part of Ser. No. 491,506, May 4, 1983, abandoned. This application Aug. 14, 1984, Ser. No. 640,500
Int. Cl.[4] B01D *53/34*
U.S. Cl. 423—226 10 Claims

1. A process for purifying gas streams of acid gas components, comprising H_2S, COS and CO_2, and catalytically hydrolyzing any COS to H_2S and CO_2, comprising contacting said gas stream in the presence of at least a minor amount of water with an acid gas absorbing solvent compound selected from the group having the formula:



where x = 1, 2 or 3 and where R_1 and R_2 are individually lower alkyl of C_1 to C_4 normal or branched hydrocarbons or R_1 and R_2 form a cyclic derivative having the structure:

so as to absorb a predominant amount of such acid gas components from said gas stream.

10. A process for purifying gas streams of acid gas components, comprising H_2S, COS and CO_2, and catalytically hydrolyzing any COS to H_2S and CO_2 comprising contacting said gas stream in the presence of at least a minor amount of water with an acid gas absorbing solvent compound selected from the group of 4,4'-(oxydi-2,1-ethenediyl)bismorpholine, 2-[2-(4-morpholinyl)ethoxy]ethanol, N,N-dimethyl-4-morpholineethanamine, and N,N-dimethyl-2-[2-(4-morpholinyl)ethoxy]ethanamine so as to absorb a predominant amount of such acid gas components from said gas stream.

4,556,547
PROCESS FOR TREATMENT OF GASES

Hiroshi Nishino, Suita; Toshio Aibe, and Katsuya Noguchi, both of Toyonaka, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Jan. 21, 1983, Ser. No. 460,045
Claims priority, application Japan, Feb. 1, 1982, 57-15422; Mar. 9, 1982, 57-37500; Mar. 9, 1982, 57-37501
Int. Cl.[4] B01D *53/34*
U.S. Cl. 423—230 10 Claims

1. A process for treatment of a gas containing hydrogen sulfide and/or carbonyl sulfide but not substantially containing oxygen, which comprises contacting the gas with activated carbon containing (1) a copper compound and (2) an alkali metal compound and/or an alkaline earth metal compound, at a temperature of not higher than 150° C., whereby hydrogen sulfide and/or carbonyl sulfide are removed from the gas.

4,556,548
PROCESS FOR PURIFYING WET-PROCESSED PHOSPHORIC ACID

Reinhard Gradl, Hürth, and Hilmar Roszinski, Erftstadt, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Dec. 1, 1983, Ser. No. 557,349
Claims priority, application Fed. Rep. of Germany, Dec. 15, 1982, 3246416
Int. Cl.[4] C01B *25/16, 15/16, 25/26;* C01F *1/00*
U.S. Cl. 423—321 S 5 Claims

1. A splitting process for purifying crude wet-process phosphoric acid containing a 45–54 weight % P_2O_5 content, consisting essentially of the steps:

(a) contacting the feed wet-process phosphoric acid with an organic solvent which is immiscible or only partially miscible with water and is capable of dissolving phosphoric acid so at most 40 to 70 weight % of the P_2O_5 content of the feed wet-process phosphoric acid is extracted by mixing the organic solvent with the said acid in a ratio by volume of more than 4:1 in a single process step, with the resulting formation of a plurality of phases between which the said P_2O_5 content is split:

an organic extract phase containing at most 40 to 70 weight % of said P_2O_5 content, and

an aqueous raffinate phase containing essentially the remaining phosphoric acid residue, the concentration of P_2O_5 in said aqueous raffinate phase being at most 28–32 weight % P_2O_5,

and separating subsequently the organic extract phase from the aqueous raffinate phase;

(b) scrubbing the separated organic extract phase with a quantity of an aqueous medium corresponding to at most 5% of the volume of the phosphoric acid extract; recycling the scrubbing solution formed into stage (a); recovering from the scrubbed phosphoric acid extract either purified phosphoric acid by reextracting the extract with water or recovering a purified alkali metal phosphate solution by reextracting the extract with an alkaline solution;

(c) neutralizing the said aqueous raffinate phase produced in step (a) by subjecting it to treatment with an alkaline agent with the resultant formation of a further purified alkali metal phosphate solution and with precipitation of a so-called neutralization sludge, and

(d) separating said neutralization sludge and alkali metal phosphate solution from one another, mixing the sludge with finely ground phosphate ore, and converting the mixture into phosphate pellets for use in electrothermal phosphorus production.

4,556,549
PROCESS FOR MAKING ZEOLITE ZSM-45 WITH AN ORGANOCOBALT COMPLEX

Ernest W. Valyocsik, Yardley, Pa., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Nov. 29, 1983, Ser. No. 555,917
Int. Cl.[4] C01B *33/28*
U.S. Cl. 423—326 6 Claims

1. A method for preparing a ZSM-45 aluminosilicate zeolite, said zeolite having the X-ray diffraction pattern as set forth in Table 1 of the specification, said method comprising the steps of

(i) preparing a mixture capable of forming said aluminosilicate zeolite, said mixture containing sources of alkali metal ions, an oxide of aluminum, an oxide of silicon, a cobalticinium ion and water and having a composition in terms of moles of oxides, falling within the following ranes:

SiO_2/Al_2O_3	10–30
OH^-/SiO_2	0.005–1.0

-continued

Z/SiO_2	0.001–5.0
H_2O/SiO_2	10–200
R/SiO_2	0.10–3

wherein R represents said cobalticinium ion and Z represents said alkali metal ion;

(ii) maintaining said mixture under sufficient conditions until a crystalline material is formed; and

(iii) recovering the crystalline material from step (ii), wherein said crystalline material is ZSM-45.

4,556,550

PROCESS FOR THE PREPARATION OF HIGH-LEVEL ION-EXCHANGED FORMS OF ZEOLITES F AND ZEOLITE W

Ronald J. Ross, Upper Nyack, and John D. Sherman, Chappaqua, both of N.Y., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Oct. 19, 1983, Ser. No. 543,360
Int. Cl.[4] C01C *3/00*
U.S. Cl. 423—328 **7 Claims**

1. The process for preparing an exchanged zeolite selected from the group consisting of zeolite W and Zeolite F comprising:

(a) contacting said zeolite having an initial cation M_i where M_i is K^+ with a solution containing between about 100 meq/l and about 2000 meq/l of ammonium ions for a time sufficient to provide a solid product with a molar ratio of $(NH_4)_2O$ to Al_2O_3 of at least 0.80;

(b) contacting the solid product of a) with a solution of the final cation M_f where M_f is selected as at least one of Ca^{++}, Mg^{++}, $Na^+$and Li^+ wherein the cation $M_f$is less preferred by the zeolite than M_i, the selectivity factory (SF_f) of the zeolite for the final cation (M_f) over the initial cation (M_i) is less than 0.5 and wherein such cation $M_f$is at a concentration between about 100 meq/l and about 2000 meq./l while the pH of such aqueous solution is maintained between about 9.0 and about 12.0 for a time sufficient to provide a zeolite slurry with a molar ratio of M_fO/Al_2O_3 of at least 0.7 and molar ratio of $(NH_4)_2O$ to Al_2O_3 less than 0.1; and

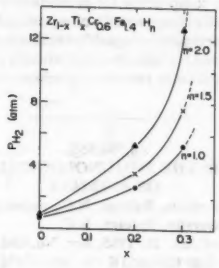
(c) obtaining a zeolite product from step b) wherein M_f cations comprise at least 50 percent of the zeolite cations.

4,556,551

HYDROGEN STORAGE MATERIALS OF ZIRCONIUM-CHROMIUM-IRON AND TITANIUM ALLOYS CHARACTERIZED BY $ZRCR_2$ STOICHIOMETRY

William E. Wallace, and Faiz Pourarian, both of Pittsburgh, Pa., assignors to Koppers Company, Inc., Pittsburgh, Pa.

Filed Mar. 22, 1984, Ser. No. 592,105
Int. Cl.[4] C01B *6/00*; C22C *30/00*
U.S. Cl. 423—644 **7 Claims**



1. An alloy of elements expressed by the following formula

$$Zr_{1-x}Ti_xCr_{2-y}Fe_y$$

wherein "x" has a value between 0.2 and 0.3 and "y" has a value of 0.1 to 1.5, and their hydrides.

4,556,552

ENTERIC FILM-COATING COMPOSITIONS

Stuart C. Porter, Hatfield; Edward J. Woznicki, Douglassville; Susan M. Grillo, North Wales, and Louis F. D'Andrea, King of Prussia, all of Pa., assignors to Colorcon, Inc., West Point, Pa.

Filed Sep. 19, 1983, Ser. No. 533,541
Int. Cl.[4] A61K *9/32*
U.S. Cl. 424—32 **11 Claims**

1. An enteric coated tablet made in accordance with the method comprising the steps of, micronizing particles of PVAP,

mixing the PVAP particles with particles of an edible water-soluble plasticizer, and auxiliary film-forming polymer, and pigmet particles, to form an enteric dry powder,

mixing the enteric dry powder into water,

and after the powder particles are thoroughly wetted,

adding an ammonium hydroxide solution to form an enteric coating suspension, and

spraying the enteric coating suspension onto tablets to form an enteric coating thereon.

4,556,553

TOOTHPASTE COMPOSITION

Nobuo Suganuma, Funabashi; Kensuke Tanaka, Kashiwa; Nobuyuki Takada, Chigasaki, and Hiromichi Ichikawa, Matsudo, all of Japan, assignors to Lion Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 316,400, Oct. 29, 1981. This application May 31, 1983, Ser. No. 499,447
Claims priority, application Japan, Nov. 20, 1980, 55-163739
Int. Cl.[4] A61K *7/16, 7/18*
U.S. Cl. 424—52 **20 Claims**

1. A toothpaste composition with which a plastics container having oxygen permeability of 3 cc/m3·day·atm or more is filled, characterized in that the toothpaste composition comprises an aluminum oxide compound as a main abrasive, water, a polyhydric alcohol in an amount of 5.0 to 100 moles per liter of water in the toothpaste composition, and a binder, wherein

said toothpaste composition exhibits antiseptic action against aerobic bacteria.

4,556,554

IMMOBILIZED ENZYMES

Luis C. Calvo, Bayshore, N.Y., assignor to Germaine Monteil Cosmetiques Corp., Deer Park, N.Y.

Filed Jun. 1, 1981, Ser. No. 269,935
Int. Cl.[4] A61K *7/06, 31/74*
U.S. Cl. 424—70 10 Claims

1. A cosmetic composition for cosmetically removing sebum containing an effective amount of an immobilized lipase enzyme, in a cosmetically-acceptable vehicle for topical application to the skin and/or hair, to enzymatically split fatty components and cellmolecular remnants in sebum to smaller molecular fragments.

4,556,555

PROCESS FOR THE IMMUNOLOGICAL NEUTERING OF ANIMALS

Kenneth L. Esbenshade, Raleigh, N.C., assignor to North Carolina State University, Raleigh, N.C.

Filed Jan. 25, 1985, Ser. No. 694,695
Int. Cl.[4] A61K *39/395, 37/38*
U.S. Cl. 424—85 14 Claims

1. A process for the immunological neutering of animals comprising

treating pre-pubertal animals to prevent the onset of puberty by introducing into the bloodstreams of the animals a predetermined amount of an antiserum containing antibodies to gonadotropin releasing hormone so as to immunize the animals against gonadotropin releasing hormone to prevent thereby the release of hormones necessary for sexual development.

4,556,556

VACCINE FOR THE PREVENTION OF VESICULAR STOMATITIS VIRUS INFECTION

Gary P. Wiesehahn; Richard E. Giles, both of Alameda, and David R. Stevens, Fremont, all of Calif., assignors to Advanced Genetics Research Institute, Oakland, Calif.

Filed Mar. 23, 1984, Ser. No. 592,661
Int. Cl.[4] H61K *39/12*
U.S. Cl. 424—89 13 Claims

1. A vaccine useful for inoculation of a mammalian host susceptible to infection by vesicular stomatitis virus (VSV), which vaccine comprises an immunologic adjuvant and about a 10^6 to 10^9 pfu/dose effective dosage amount of at least one inactivated VSV serotype, wherein the VSV has been inactivated by exposure to long wavelength ultraviolet light at a temperature below about 40° C. under conditions excluding free oxygen and in an inert atmosphere in the presence of an inactivating furocoumarin for a time sufficient to render said VSV non-infectious, whereby the immunogenicity is substantially retained.

4,556,557

METHOD AND COMPOSITION FOR COMBATING SNORING, AND THE USE OF SURFACE ACTIVE SUBSTANCES FOR THE PREPARATION OF SAID COMPOSITION

Dietrich Reichert, Mühlenwiese 51, D-2806 Oyten-Schaphusen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 327,585, Dec. 4, 1981, abandoned. This application Jul. 15, 1983, Ser. No. 514,182
Claims priority, application Fed. Rep. of Germany, Dec. 6, 1980, 3046125; Dec. 10, 1980, 3046484
Int. Cl.[4] A61K *37/48, 33/14, 31/355, 31/235*
U.S. Cl. 424—94 11 Claims

1. A method of combating snoring, which comprises administering to a snoring victim's nasopharyngeal mucous membranes, shortly prior to his or her retiring for sleep, a composition containing

(a) 0.05 to 2% by weight of a non-ionic surface active substance compatible with the mucous membranes and largely free of undesirable smell and taste and

(b) 0.01 to 4% by weight of a pharmaceutically acceptable agent selected from the group consisting of a preserving agent and substances acting bactericidally or fungicidally on the mucous membranes,

in a physiological common salt solution.

4,556,558

TREATMENT OF FACTOR VIII CONCENTRATE TO MINIMIZE THE AFFECT OF UNDESIRABLE MICROORGANISMS

Alan Rubinstein, Beverly Hills, Calif., assignor to Cedars-Sinai Medical Center, Los Angeles, Calif.

Continuation of Ser. No. 499,489, May 31, 1983, abandoned, which is a continuation-in-part of Ser. No. 377,863, May 13, 1982, Pat. No. 4,456,590, which is a continuation-in-part of Ser. No. 317,513, Nov. 2, 1981, abandoned, which is a continuation of Ser. No. 205,913, Nov. 12, 1980, abandoned. This application Jun. 26, 1984, Ser. No. 624,992
The portion of the term of this patent subsequent to Jun. 26, 2001, has been disclaimed.
Int. Cl.[4] A61K *35/16*
U.S. Cl. 424—101 12 Claims

1. A method of treating human blood clotting Factor VIII concentrate in order to minimize the effect of undesirable virus microorganisms present in said human blood clotting Factor VIII concentrate, said method comprising the steps of:

lyophilizing said human blood clotting Factor VIII concentrate;

heating said lyophilized human blood clotting Factor VIII concentrate at a predetermined temperature of at least about 60° C. for a period of time sufficient to minimize the effect of any undesirable virus microorganisms present in said human blood clotting Factor VIII concentrate, said heating generally decreasing as said predetermined temperature is increased.

9. A human blood clotting Factor VIII concentrate, said human blood clotting Factor VIII concentrate having been treated to minimize the effect of undesirable virus microorganisms by lyophilizing said human blood clotting Factor VIII concentrate followed by heating at a predetermined temperature of at least about 60° C. for a period time sufficient to minimize the effect of any undesirable virus microorganisms.

4,556,559

ANTIBIOTICS

Martin Cole, Dorking; Thomas T. Howarth, Rudwick, and Christopher Reading, Southwater, all of England, assignors to Beecham Group p.l.c., England

Division of Ser. No. 726,224, Sep. 24, 1976, Pat. No. 4,427,690, which is a division of Ser. No. 569,007, Apr. 17, 1975. This application Jul. 13, 1978, Ser. No. 924,174
Claims priority, application United Kingdom, Apr. 20, 1974, 17410/74; Jun. 21, 1974, 27715/74; Oct. 9, 1974, 43651/74; Dec. 11, 1974, 53525/74
Int. Cl.[4] A61K *35/00*
U.S. Cl. 424—114 78 Claims

37. A method of treating bacterial infections in humans and animals which comprises administering to a human or animal in need thereof a synergistically pharmaceutical composition which comprises a synergistically pharmaceutically acceptable clavulanic acid ester and an antibacterially effective amount of a penicillin, in combination with a pharmaceutically acceptable carrier.

4,556,560

METHODS FOR THE TREATMENT AND PROPHYLAXIS OF DIAPER RASH AND DIAPER DERMATITIS

Kent W. Buckingham, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Jan. 24, 1983, Ser. No. 460,692
Int. Cl.[4] A61K *33/24, 33/30*
U.S. Cl. 424—145 27 Claims

1. A method of treating and preventing diaper rash, or diaper dermatitis, caused by prolonged contact of human skin with body waste, which method comprises topically applying to an area in need of such treatment or prevention a minimum inhibitory concentration of a pharmaceutically-acceptable lipase-inhibiting agent selected from the group consisting of water-soluble salts of cadmium, cobalt, lead, mercury, molybdenum, nickel, silver, lanthanum, tin, zinc and iron.

4,556,561

COMPOSITIONS AND METHODS FOR TOPICALLY FLUORIDATING AND/OR MINERALIZING DENTAL TISSUE

Walter E. Brown, Rockville, and Laurence C. Chow, Gaithersburg, both of Md., assignors to American Dental Association Health Foundation, Washington, D.C.

Continuation of Ser. No. 478,888, Mar. 25, 1983, abandoned. This application Feb. 5, 1985, Ser. No. 698,314
Int. Cl.[4] A61K *7/18, 33/16, 33/42*
U.S. Cl. 424—151 7 Claims

1. A method for topically fluoridating and/or mineralizing dental tissue such that $Ca_5(PO_4)_3$ is incorporated into the tissue, comprising in combination the following steps:

(a) treating the surface of the tissue with a substantially nonaqueous dispersion such that $CaHPO_4.2H_2O$ is formed in the surface of the tissue, the dispersion containing (1) $Ca_5(PO_4)_3F$ and (2) at least one calcium phosphate compound selected from the group consisting of $Ca(H_2PO_4)_2.H_2O$ and $Ca(H_2PO_4)_2$, the treatment step occurring in the presence of a dilute aqueous solvent such that the dispersion and the solvent form an aqueous solution or gel containing calcium and phosphate ions in concentrations greater than or equal to approximately fifty percent of the saturation concentration for $CaHPO_4.2H_2O$ in the solution or gel, the solution or gel being saturated with respect to $Ca_5(PO_4)_3F$, and the solution or gel having a pH less then or equal to approximately 4.3; and

(b) applying a fluoridation agent selected from the group consisting of acidulated phosphate fluoride, SnF_2, NaF and TiF_4 to the surface of the tissue.

4,556,562

STABLE ANTI-PEST NEEM SEED EXTRACT

Robert O. Larson, Sheboygan, Wis., assignor to Vikwood, Ltd., Sheboygan, Wis.

Filed Mar. 19, 1984, Ser. No. 590,808
Int. Cl.[4] A01N *65/00, 43/16*
U.S. Cl. 424—195.1 18 Claims

1. A process for preparing a storage stable neem seed extract, said process comprising the steps of:

(a) forming neem seed particles ranging in size from about 350 microns to about 2 millimeters (maximum dimension);

(b) extracting the paticles with extracting agent comprising ethanol at a temperature ranging from about 60° C. to about 90° C. and separating the extract to obtain a solution comprising from about 5,000 to about 10,000 ppm azadirachtin;

(c) diluting to form an aqueous emulsion comprising from about 2,000 to about 4,000 ppm azadirachtin;

(d) measuring the pH, and if it is outside the range of from about 3.5 to about 6.0, adjusting the pH to range from about 3.5 to about 6.0.

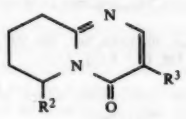
4,556,563

SYNERGISTIC ANTIPHLOGISTIC COMPOSITIONS AND METHODS OF USE

Marianna Pongor née Csákvári; Gábor Nagy; Gábor Horváth; Mária Dávid née Kenéz; Sándor Bozsóky; Sándor Virág, all of Budapest, and Katalin Mármarosi née Kellner, Biatorbágy, all of Hungary, assignors to Chinoin Gyogyszer es Vegyeszeti Termekek Gyara Rt., Budapest, Hungary

Filed Mar. 10, 1983, Ser. No. 474,750
Claims priority, application Hungary, Mar. 31, 1982, 976/82
Int. Cl.[4] A61K *31/60, 31/505*
U.S. Cl. 514—258 8 Claims

1. A synergistic, antiphlogistic pharmaceutical composition comprising a compound of the Formula (I)

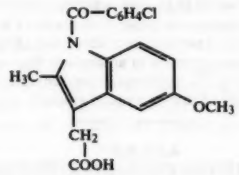


(I)

wherein

R^2 is lower alkyl, and

R^3 is lower alkoxycarbonyl, or a pharmaceutically acceptable acid addition or quaternary ammonium salt thereof, and indomethacin of the Formula (II)



(II)

or a pharmaceutically acceptable salt thereof, in admixture with a pharmaceutically acceptable inert carrier wherein the weight ratio is 10 to 50 parts of the compound of the Formula (I) to 1 part of the indomethacin of the Formula (II).

4,556,564

FEEDING OF ZEOLITE A TO POULTRY

Sebastian M. Laurent, Greenwell Springs, and Robert N. Sanders, Baton Rouge, both of La., assignors to Ethyl Corporation, Richmond, Va.

Filed Mar. 14, 1983, Ser. No. 475,370
Int. Cl.[4] A23K *1/24*
U.S. Cl. 426—2 12 Claims

1. A method of increasing the quality of the egg shell of a poultry laying hen wherein an effective amount of zeolite A sufficient to improve the quality of the egg shell up to about 4 weight percent of the feed is added to the feed of the hen and the feed is fed to the hen.

4,556,565

SWEETENER COMPOSITION, PROCESS FOR MAKING THE SAME, AND COMESTIBLES COMPRISING SAID SWEETENER COMPOSITION

Tetsuo Arima, Room 301, Kurebayashi Mansion 3-9-8, Shimorenjaku, Mitaka, Tokyo 181; Akio Kawamoto, Room 603, Shimoda Bldg. 1-6-2, Yasujima, Yokkaichi Mie Pref. 510, and Hide Osawa, Room 301, Teio Plaza 1-7-27, Sanjo, Suzuka, Mie Pref., 513, all of Japan

Filed Nov. 4, 1983, Ser. No. 548,734
Int. Cl.[4] A23G *3/30*
U.S. Cl. 426—3 6 Claims

1. An improved sugarless chewing gum containing a sweet-

ener composition consisting essentially of L-aspartyl-L-phenylalanine methyl ester, hydrogenated starch hydrolyzate and/or hydrogenated maltose and a sugar alcohol, the improvement comprising: a chewing gum base wherein calcium carbonate and talc are replaced by microcrystalline cellulose powder; and an edible organic acid and sodium citrate and/or glucono-delta-lactose in an amount sufficient to give a ph of 3.3 to 5.3.

4,556,566

SALT SUBSTITUTE CONTAINING POTASSIUM CHLORIDE COATED WITH A MIXTURE OF MALTODEXTRIN AND SODIUM CHLORIDE AND METHOD OF PREPARATION

Alexis D. Bell, St. Louis, Mo., assignor to Mallinckrodt, Inc., St. Louis, Mo.

Filed Jun. 30, 1983, Ser. No. 509,844
Int. Cl.[4] A23L *1/237*
U.S. Cl. 426—96 **15 Claims**

1. A salt substitute composition which comprises coated particles, each particle comprising:

(a) a core comprising potassium chloride and

(b) a coating on said core, said coating comprising a mixture containing:

(i) maltodextrin and

(ii) sodium chloride

wherein the dextrose equivalent (D.E.) value of the combined amount of potassium chloride, maltodextrin and sodium chloride is not more than 10 D.E. units and the potassium chloride is present in an amount from about 90 to about 17%, the maltodextrin is present in an amount from about 7 to about 30%, and the sodium chloride is present in an amount from about 0.1 to about 75%, wherein the percentage amounts are by weight based on the weight of said combined amount.

4,556,567

SALT SUBSTITUTE CONTAINING POTASSIUM CHLORIDE COATED WITH MALTODEXTRIN AND METHOD OF PREPARATION

David R. Meyer, Chesterfield, Mo., assignor to Mallinckrodt, Inc., St. Louis, Mo.

Filed Jun. 30, 1983, Ser. No. 509,846
Int. Cl.[4] A23L *1/237*
U.S. Cl. 426—96 **18 Claims**

1. A salt substitute composition which comprises coated particles, each particle comprising:

(a) a core comprising potassium chloride and

(b) a coating on said core, said coating comprising maltodextrin and being free of sodium chloride, wherein the dextrose equivalent (D.E.) value of the combined amount of potassium chloride and matodextrin is not more than 10 D.E. units and the potassium chloride is present in an amount from about 99 to about 60% and the maltodextrin is present in an amount from about 1 to about 40%, wherein the percentage amounts are by weight based on the weight of said combined amount.

4,556,568

SALT SUBSTITUTE CONTAINING POTASSIUM CHLORIDE COATED WITH A MIXTURE INCLUDING MALTODEXTRIN AND POTASSIUM BITARTRATE AND METHOD OF PREPARATION

David R. Meyer, Chesterfield, Mo., assignor to Mallinckrodt, Inc., St. Louis, Mo.

Filed Jun. 30, 1983, Ser. No. 509,848
Int. Cl.[4] A23L *1/237*
U.S. Cl. 426—96 **31 Claims**

1. A salt substitute composition which comprises coated particles, each particle comprising:

(a) a core comprising potassium chloride and

(b) a coating on said core, said coating comprising a mixture comprising:

(i) maltodextrin and

(ii) cream of tartar,

wherein the dextrose equivalent (D.E.) value of the combined amount of potassium chloride, maltodextrin and cream of tartar is not more than 10 D.E. units and the potassium chloride is present in an amount from about 91 to about 59%, the maltodextrin is present in an amount from about 1 to about 40%, and the cream of tartar is present in an amount from about 0.1 to about 0.9%, wherein the percentage amounts are by weight based on the weight of said combined amount.

4,556,569

SOY MILK CONTAINING CHEESE ANALOG

Rita W. Brander, New Rochelle, N.Y.; Teresa A. Raap, Ridgefield, Conn., and Joseph F. Gessler, West Milford, N.J., assignors to General Foods Corporation, White Plains, N.Y.

Filed Mar. 19, 1984, Ser. No. 591,294
Int. Cl.[4] A23C *20/00*
U.S. Cl. 426—104 **4 Claims**

1. A cheese analog product having a natural pH of about 7.0±0.05 and being a water dispersion comprising the following components in the following weight percent:

Component	Weight % Range
Water	38 to 58
Dried Soy Milk	9 to 19
Vegetable Oil	14 to 22
Dried Dairy Whey comprising a total protein component within the range from about 11 to about 15 weight %	7 to 13
Caseinate	2 to 10

with the remainder, if any, being flavorants and colorants, to total 100%.

4,556,570

VIENNA SAUSAGE MEAT ANALOG

Rita W. Brander, New Rochelle, N.Y.; Teresa A. Raap, Ridgefield, Conn., and Marshall M. Rankowitz, Englishtown, N.J., assignors to General Foods Corporation, White Plains, N.Y.

Filed Mar. 26, 1984, Ser. No. 593,451
Int. Cl.[4] A23J *3/00*; A23L *1/04*
U.S. Cl. 426—104 **12 Claims**

1. An improved Vienna sausage meat analog product approximating the juiciness and tenderness properties of an all meat product and comprising a dispersion of about 10 to about 50 weight percent of a fat release emulsion phase dispersed in about 50 to about 90 weight percent of a continuous matrix phase, said continuous matrix phase comprising water, protein within the range of from about 5 to about 50 weight of the matrix phase said protein including an edible heat coagulable proteinaceous material, a hydrocolloid within the range of from about 0.05 to 3 weight percent selected from the group consisting of xanthan gum and locust bean gum, and mixtures thereof, a particulate unmodified waxy maize starch of branched chain amlyopectin polymers within the range of from about 3 to about 30 weight percent and a liquid or semi-liquid fat at a level of up to about 50 weight percent,

said fat release emulsion phase comprising at least about 65 weight percent of vegetable oil, water within the range of from about 10 to about 30 weight percent, and a non-vegetable protein within the range of from about 5 to about 10 weight percent selected from the group consisting of albumin, casein and whey and mixtures thereof,

said dispersion being stuffed into an edible or non-edible casing and heat set to produce an improved Vienna sausage meat analog.

4,556,571

USE OF SOY PRODUCTS HAVING A REDUCED BEANY FLAVOR IN MEAT AND OTHER FOOD PRODUCTS

William E. Swartz, Upper St. Clair; Charles W. Everson, McMurray, and Fredric G. Bender, Houston, all of Pa., assignors to Stauffer Chemical Company, Westport, Conn.

Continuation of Ser. No. 541,943, Oct. 14, 1983, abandoned. This application May 30, 1985, Ser. No. 739,491

Int. Cl.[4] A23J *3/00*; A23L *1/272*

U.S. Cl. 426—265 **22 Claims**

1. A method for preparing a soy protein product having a reduced beany flavor which comprises hydrating said protein selected from the group consisting of soy flour, soy concentrate and soy isolate having a protein content ranging from about 40% to about 90% with a solution of primary yeast autolyzate extract until the soy protein product absorbs at least 100% of its weight of the solution in an amount sufficient to reduce the beany flavor.

4,556,572

METHOD OF FIXING AN EDIBLE COATING TO A FOOD PRODUCT

Harold B. Kaufman, Jr.; John P. McCarthy, both of New York, N.Y.; Bernard J. Entner, Nutley, N.J., and Kurt Wallenfels, New York, N.Y., assignors to DCA Food Industries Inc., New York, N.Y.

Continuation of Ser. No. 839,616, Oct. 5, 1977, abandoned. This application Dec. 14, 1979, Ser. No. 103,866

Int. Cl.[4] A23L *3/16*

U.S. Cl. 426—289 **6 Claims**

1. A method of fixing an edible coating to a food product without frying which comprises applying a starch-containing coating composition to the exterior of a food product, exposing said coated food product to superheated steam at atmospheric pressure in the substantial absence of air for a time which is sufficient to stabilize said coating and adhere said coating to the food product but which is insufficient to substantially cook said coated food product.

4,556,573

METHOD FOR TREATING SOYBEANS

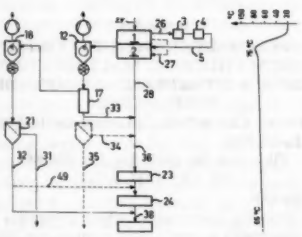
Helmut Bartesch, Ravensburg, and Gerd Florin, Vorberg, both of Fed. Rep. of Germany, assignors to Escher Wyss Limited, Zürich, Switzerland

Filed Oct. 19, 1981, Ser. No. 312,660

Claims priority, application Switzerland, Nov. 4, 1980, 8186/80

Int. Cl.[4] A23L *1/20*

U.S. Cl. 426—467 **15 Claims**



1. A method for the continuous preparatory treatment of soybeans in order to recover soybean oil and soybean meal, comprising the steps of:

applying to the soybeans composed of hulls and seeds contained in such hulls a substantially homogeneous heat treatment in a fluidized bed for a relatively brief amount of time insufficient for substantial heat diffusion to the seeds, so as to essentially apply heat only to the hulls and the outer surface of the seeds, in order to render the hulls brittle and to cause them to loosen from the seeds;

feeding the substantially homogeneously heat treated soybeans from the fluidized bed to a corrugated roll mill without any intermediate cooling thereof;

subjecting the substantially homogeneously heat treated soybeans while in a heated condition within said corrugated roll mill to forces in order to split the soybeans, so that there are substantially formed split seeds and split hulls;

removing the split soybeans composed of the split seeds and the split hulls from the corrugated roll mill;

feeding the removed soybeans without any intermediate cooling to a separate impacting device; and

then subjecting the split soybeans composed of the split seeds and split hulls within the impacting device to an impacting action in order to separate a predominant part of the split hulls from their related split seeds.

13. A method for the continuous preparatory treatment of soybeans in order to recover soybean oil and soybean meal, comprising the steps of:

applying to the soybeans composed of hulls and seeds contained in such hulls a substantially homogeneous heat treatment in a fluidized bed for a relatively brief amount of time insufficient for substantial heat diffusion to the seeds, in order to render the hulls brittle and to cause them to detach from the seeds;

feeding the substantially homogeneously heat-treated soybeans to a corrugated roll mill without any intermediate cooling thereof;

subjecting the substantially homogeneously heat treated soybeans while in a heated condition within said corrugated roll mill to forces in order to split the soybeans, so that there are substantially formed split seeds and split hulls;

removing the split soybeans composed of the split seeds and split hulls from the corrugated roll mill;

feeding the split soybeans containing the split seeds and split hulls, without any intermediate cooling of the split soybeans, to an impacting device arranged after the corrugated roll mill; and

then subjecting the split soybeans containing the split seeds and split hulls within said impacting device to an impacting action in order to separate a predominant part of the split hulls from their related split seeds.

4,556,574

METHOD OF IMPROVING THE WHIPPING PROPERTIES OF CREAM

Kenneth Andersson, S. Sandby, and Per Pihl, Lund, both of Sweden, assignors to Alfa-Laval AB, Tumba, Sweden

PCT No. PCT/SE83/00121, § 371 Date Nov. 1, 1983, § 102(e) Date Nov. 1, 1983, PCT Pub. No. WO83/03337, PCT Pub. Date Oct. 13, 1983

PCT Filed Mar. 30, 1983, Ser. No. 552,128

Claims priority, application Sweden, Apr. 1, 1982, 8202102

Int. Cl.[4] A23C *13/00*

U.S. Cl. 426—570 **8 Claims**

1. A process for the production of cream having improved whipping properties, which comprises concentrating buttermilk by ultrafiltration, then acidifying the concentrated buttermilk to a pH below 4.0, adding the acidified buttermilk concentrate to cream having a predetermined fat content, the amount of said added concentrate being in the range of 5–15% of the amount of the cream, and neutralizing the mixture of buttermilk concentrate and cream.

4,556,575

METHOD FOR AROMATIZING SOLUBLE COFFEE

Saul N. Katz, Monsey, N.Y., and Donald T. Kearney, Bayonne, N.J., assignors to General Foods Corporation, White Plains, N.Y.

Continuation-in-part of Ser. No. 481,005, Mar. 31, 1983, abandoned. This application Jul. 31, 1984, Ser. No. 636,207
Int. Cl.[4] A23F *5/00*
U.S. Cl. 426—594 14 Claims

1. A method for producing an aromatized soluble coffee product comprising the steps of:

(a) condensing, as a frost, coffee grinder gas;

(b) placing the grinder gas frost in a pressure vessel;

(c) supplying heat to the contents of the vessel and allowing the frost to equilibrate at a pressure in excess of 506.2 psia and at a temperature of greater than 32° F., to form three phases: (1) gaseous carbon dioxide plus aromatics, (2) liquid carbon dioxide plus aromatics, and (3) liquid water containing aromatics;

(d) removing the water phase which contains aromatics from the vessel;

(e) contacting a glyceride with the water phase of step (d) for a period of time effective to transfer aromatics from said water phase to the glyceride;

(f) introducing the glyceride, which contains aromatics transferred from the water phase, into the pressure vessel of step (b);

(g) supplying heat to the contents of the vessel in order to raise the temperature to between 80° to 85° F., and thereby increase the pressure to about 750 to 850 psia, to form three phases: (1) gaseous carbon dioxide plus aromatics, (2) liquid carbon dioxide plus aromatics, and (3) liquid glyceride which contains water phase aromatics;

(h) refluxing, in a packed column, liquid carbon dioxide and gaseous carbon dioxide phases, while slowly venting thereby removing "lean" carbon dioxide from the vessel and concentrating aromatics in the glyceride, until the pressure drops to about 650 to 700 psia;

(i) depressurizing the vessel;

(j) obtaining an aromatized glyceride; and

(k) combining the aromatized glyceride with soluble coffee powder.

4,556,576

PROCESS FOR PREPARING TOMATO PRODUCTS OF INCREASED CONSISTENCY

David P. Gaehring, Collingswood, N.J., assignor to Campbell Soup Company, Camden, N.J.

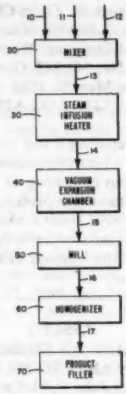
Filed Mar. 2, 1984, Ser. No. 585,537
Int. Cl.[4] A23L *1/00*
U.S. Cl. 426—615 17 Claims

1. A process for preparing blended tomato products of increased consistency comprising:

(a) rapidly heating a concentrated tomato product to a temperature of at least about 250° F. (120° C.) by direct contact with high-temperature steam in a steam in fusion heater,

(b) rapidly expanding the heated concentrate to a lower subatmospheric pressure, and

(c) milling the rapidly expanded concentrate through a screen having openings smaller than 0.85 mm so as to



cause a substantial increase in the consistency of said concentrate.

4,556,577

ADMIXTURE OF POTASSIUM CHLORIDE AND MALTODEXTRIN AS SALT SUBSTITUTE AND METHOD OF PREPARATION

David R. Meyer, Chesterfield, Mo., assignor to Mallinckrodt, Inc., St. Louis, Mo.

Filed Jun. 30, 1983, Ser. No. 509,845
Int. Cl.[4] A23L *1/237*
U.S. Cl. 426—649 15 Claims

1. A salt substitute composition which comprises a uniform admixture consisting essentially of, as particulate components thereof:

(a) potassium chloride and

(b) maltodextrin,

wherein said components are present in the percentage amounts set forth:

potassium chloride: from about 99 to about 60%, and

maltodextrin: from about 1 to about 40%,

wherein the percentage amounts are by weight based on the combined weight of said components and the dextrose equivalent (D.E.) value of the combined amount of potassium chloride and maltodextrin is not more than 10 D.E. units.

4,556,578

NACL-FREE SALT SUBSTITUTE CONTAINING POTASSIUM CHLORIDE, MALTODEXTRIN AND POTASSIUM BITARTRATE AND METHOD OF PREPARATION

David R. Meyer, Chesterfield, Mo., assignor to Mallinckrodt, Inc., St. Louis, Mo.

Filed Jun. 30, 1983, Ser. No. 509,847
Int. Cl.[4] A23L *1/237*
U.S. Cl. 426—649 15 Claims

1. A salt substitute composition which comprises a uniform admixture comprising as particulate components thereof:

(a) potasssium chloride,

(b) maltodextrin and

(c) cream of tartar,

said admixture being free of sodium chloride, wherein said components are present in the percentage amounts set forth:

potassium chloride: from about 99 to about 59%,

maltodextrin: from about 1 to about 40%, and

cream of tartar: from about 0.1 to about 0.9%,

wherein the percentage amounts are by weight based on the

combined weight of said components and the dextrose equivalent (D.E.) value of the combined amount of potassium chloride, maltodextrin and cream of tartar is not more than 10 D.E. units.

4,556,579

METHOD FOR DEVELOPING AND FIXING LATENT FINGERPRINTS

Freeman H. Lowell, 510 24th St., West Palm Beach, Fla. 33407

Filed Jan. 30, 1984, Ser. No. 575,155
Int. Cl.[4] A61B *5/10*
U.S. Cl. 427—1 **10 Claims**

1. A method for developing and fixing latent fingerprints on a solid surface which comprises the steps of:

(a) providing a porous, shaped, self-supporting plug constituted by cellulose acetate fibers and a glycerol ester-type plasticizer;

(b) depositing a liquid cyanoacrylate monomer onto the plug in an amount sufficient to generate fumes; and

(c) exposing a solid surface suspected of bearing a latent fingerprint to the generated fumes for a period of time sufficient to develop such latent fingerprint.

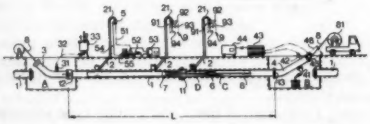
6. A fingerprint developing kit comprising a supply of liquid cyanoacrylate monomer, a supply of shaped, self-supporting fiber plugs constituted by cellulose acetate fibers and a glycerol ester-type plasticizer; and a solvent for cyanoacrylate-derived polymerizate.

4,556,580

METHOD OF REPAIRING PIPES LAID UNDERGROUND

Takashi Kamuro, Kawasaki; Hisao Ootsuga, Yokohama; Isao Saito, Kawasaki, and Motoyuki Koga, Tokyo, all of Japan, assignors to Tokyo Gas Co., Ltd. and Hakko Co., Ltd., both of Tokyo, Japan

Filed Dec. 24, 1984, Ser. No. 685,285
Claims priority, application Japan, Dec. 28, 1983, 58-246635
Int. Cl.[4] B05D *7/22, 1/42*
U.S. Cl. 427—8 **4 Claims**



1. A method for repairing pipes laid underground in which a main pipe has plural distribution pipes branching off from the main pipe to supply users with commodities such as gas, characterized by

the main pipe being divided into sections of certain length to be repaired when repairing said main pipe and distribution pipes from their inside using resin,

repairs being carried out on the main pipe in each section to be repaired by shifting resin through the pipe by drawing a pig along the pipe toward one opening in the section to be repaired by inserting the resin used for the repairing and a pig which will be drawn through the pipe in order to push this resin along inside of the pipe from the other opening in the section to be repaired,

allowing said resin to enter and block the entrance to each of the distribution pipes branching off from said main pipe when repairing said main pipe,

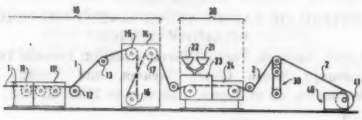
enabling sealage testing to be made on the main pipe after each repair or after all the repairs have been carried out in the section which has been repaired, by the blockage of said entrances with resin.

4,556,581

METHOD OF MANUFACTURING AN INSULANT HAVING A SELF RETICULATING CELLULAR STRUCTURE

Jean Marcel Martin, Grigny, France, assignor to Les Cables de Lyon, Clichy, France

Filed Dec. 4, 1984, Ser. No. 678,185
Claims priority, application France, Dec. 5, 1983, 83 19404
Int. Cl.[4] B05D *1/22*
U.S. Cl. 427—29 **2 Claims**



1. A method of manufacturing an insulant having a self reticulating structure for an electrical cable including at least one bare wire obtained from a wire-drawing machine, the method comprising:

using grafted polyethylene which is finely crushed or which is obtained in powder form;

finely crushing gypsum to act as an expansion agent and as a reticulation catalyst;

mixing the polyethylene and the gypsum without kneading; and

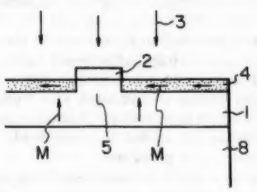
making a fluidized bed or an electrostatic suspension of the resulting mixture and passing a bare wire through the resulting fluidized or suspended mixture while the wire is at high temperature at the outlet from the wire-drawing machine, the temperature being in the range 200° C. to 350° C.

4,556,582

METHOD OF FABRICATING MAGNETIC BUBBLE MEMORY DEVICE

Ryo Imura, Sayama; Tadashi Ikeda, Kodaira; Teruaki Takeuchi, Kokubunji; Hiroshi Umezaki, Mitaka; Ryo Suzuki, Kodaira, and Yutaka Sugita, Tokorozawa, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 5, 1982, Ser. No. 375,180
Claims priority, application Japan, May 11, 1981, 56-69440
Int. Cl.[4] B05D *3/06;* **G11C** *19/08*
U.S. Cl. 427—38 **14 Claims**



1. In a method of fabricating a magnetic bubble memory device comprising the steps of implanting ions in a desired portion of a surface region in a magnetic bubble film for magnetic bubbles and annealing said magnetic bubble film, the improvement comprising:

(a) said implanting ions in a desired portion of a surface region being performed to form a strain layer having a strain of about 1% to about 2.5%;

(b) providing a film on said magnetic bubble film after the ion implanting step to cover said magnetic bubble film with said film; and

(c) said annealing said magnetic bubble film being performed after providing the film on the magnetic bubble film, and

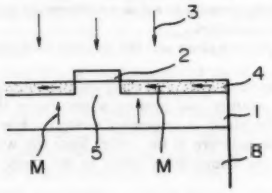
is performed at a temperature for a time, said annealing temperature and said annealing time being indicated by a point within a region shown in FIG. 8, whereby, by implanting ions to form a strain layer having a strain of about 1% to about 2.5% and by annealing said magnetic bubble film at an annealing temperature and time within a region A shown in FIG. 8, reduction in propagation margin due to annealing is low and a device having a propagation margin of 7% or more can be provided.

4,556,583

METHOD OF FABRICATING MAGNETIC BUBBLE MEMORY DEVICE

Ryo Imura, Sayama; Tadashi Ikeda, Kodaira; Teruaki Takeuchi, Kokubunji; Norio Ohta, Sayama, and Yutaka Sugita, Tokorozawa, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 5, 1982, Ser. No. 375,216
Claims priority, application Japan, May 11, 1981, 56-69441
The portion of the term of this patent subsequent to Dec. 3, 1985, has been disclaimed.
Int. Cl.⁴ B05D *3/06;* **G11C** *19/08*
U.S. Cl. 427—38 **22 Claims**



1. In a method of fabricating a magnetic bubble memory device comprising the steps of implanting ions in a desired portion of a surface region in a magnetic bubble film for magnetic bubbles and annealing said magnetic bubble film, the improvement comprising:

wherein said implanting is performed using hydrogen ions and is performed by placing said magnetic bubble film on a rotary table and, while said rotary table is turning, implanting hydrogen ions in said desired portion of the surface region in said magnetic bubble film for magnetic bubbles with an ion dose of 2.5×10^{16} to 1×10^{17} cm^{-2} to form an ion-implanted layer, the implanting while turning the rotary table acting to prevent the temperature of the magnetic bubble film from rising so that the temperature of the magnetic bubble film is not higher than a predetermined temperature when said ion implantation is effected, whereby release of hydrogen ions from the bubble film and reduction in anisotropy field ΔH_k caused by excessive temperature rise of the magnetic bubble film during ion implantation are prevented;

and wherein a film is formed on said magnetic bubble film to cover said magnetic bubble film prior to annealing said magnetic bubble film, said annealing being performed to smooth a strain distribution in said ion-implanted layer.

4,556,584

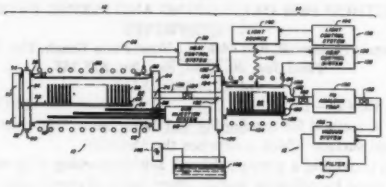
METHOD FOR PROVIDING SUBSTANTIALLY WASTE-FREE CHEMICAL VAPOR DEPOSITION OF THIN-FILM ON SEMICONDUCTOR SUBSTRATES

Robert F. Sarkozy, Westford, Mass., assignor to BTU Engineering Corporation, North Billerica, Mass.

Filed May 3, 1984, Ser. No. 606,769
Int. Cl.⁴ B05D *3/06*
U.S. Cl. 427—54.1 **7 Claims**

1. A method for providing substantially waste-free chemical vapor deposition (CVD) of thin-film on semiconductor substrates, comprising the steps of:

depositing selected thin-film on semiconductor substrates in a first chemical vapor deposition (CVD) reaction chamber of a diffusion furnace by a first comparatively low-efficiency CVD reaction that produces a substantial effluent-waste stream; and



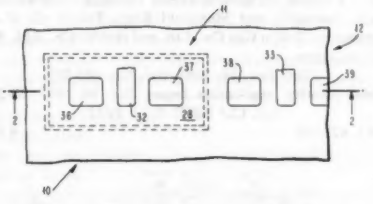
depositing substantially all of the effluent-waste stream on the surfaces of elements provided therefor by a second comparatively high-efficiency CVD reaction different from the first comparatively low-efficiency CVD reaction in a second chemical vapor deposition diffusion furnace.

4,556,585

VERTICALLY ISOLATED COMPLEMENTARY TRANSISTORS

John R. Abernathey, Jericho, and Charles W. Koburger, III, Underhill, both of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 28, 1985, Ser. No. 695,716
Int. Cl.⁴ B05D *5/12*
U.S. Cl. 427—85 **5 Claims**



1. A method of forming an improved semiconductor comprising the steps of:

providing a substrate of first conductivity type semiconductor material,

growing an epitaxial layer of the same conductivity type semiconductor material on said substrate,

etching through said epitaxial layer to said substrate, to form a cavity in said epitaxial layer,

coating the walls of said channel with a series of layers of insulating material, and

depositing semiconductor material of a second conductivity type in said cavity on said substrate and between said coated walls, said deposited semiconductor material being in intimate contact with said substrate and isolated from said epitaxial layer by said coated walls.

4,556,586

PAINT MACHINE AND METHOD OF OPERATION

Joel H. Barlow, and Michael Michaels, both c/o Inland Fabricators, Inc., 1734 Inland Dr., Ottawa, Ill. 61350

Filed Nov. 19, 1984, Ser. No. 674,179
Int. Cl.⁴ B05D *5/00, 1/32;* **B05B** *13/02, 15/04*
U.S. Cl. 427—282 **12 Claims**

1. An apparatus for painting parts, comprising:

a part indexing mechanism rotatable about a first axis and

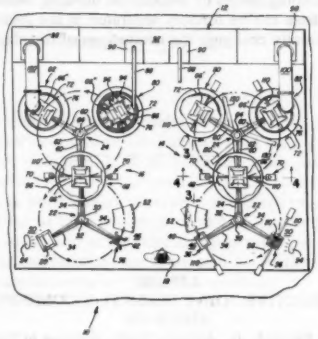
having first and second means for supporting a part at a first radial distance from said first axis;

a shield indexing mechanism rotatable about a second axis and supporting first and second shields a second radial distance from the second axis, said first and second axes being spaced whereby one of said shields may be aligned with one of said support means at a paint station between said axes;

means for mating an aligned shield and a supported part at the paint station;

means for painting a part when mated with a shield at the paint station; and

means for washing paint from one shield when the other shield is at the paint station, said shield indexing mechanism rotating about the second axis to move the shields between the paint station and the washing means.



10. A method for repetitively painting parts having portions thereof protected by a shield, there being one shield mounted on each arm of a first rotatable turret, comprising the steps of:

rotating the first turret to locate one of the shields at the paint station;

placing a part to be painted on one support of a second turret having two supports rotatable together around an axis;

rotating the second turret to locate a supported part beneath the shield located at a paint station;

mating the part and shield at the paint station;

painting the part at the paint station;

placing another part on the other first turret support;

disengaging the part from the shield at the paint station; and

repeating the placing through disengaging steps at least a selected number of times for each repetition of the step of rotating the first turret, and further comprising the step of washing the shield which is not located at the paint station.

4,556,587

PROCESS FOR ELECTRO-MAGNETIC INTERFERENCE SHIELDING

Chris Tsiamis, New York, and John E. McCaskie, No. Merrick, both of N.Y., assignors to LeaRonal, Inc., Freeport, N.Y.

Division of Ser. No. 510,377, Jun. 30, 1983. This application Dec. 19, 1983, Ser. No. 563,015

Int. Cl.⁴ C23C *3/02*

U.S. Cl. 427—304 **13 Claims**

1. A process for EMI Shielding of plastic or elastomeric materials which comprises:

(a) gas-etching the surface of said material by exposure to an atmosphere containing gaseous sulfur trioxide;

(b) controlling the gas-etching reaction to a point where the surface will accept a deposit of an activating colloidal metal;

(c) activating the etched surface by immersion into a solution containing a colloidal metal catalyst; and

(d) plating the substrate with an electroless metal plating bath that contains an organic compound having a thiocarbonyl group in combination with a complexing agent capable of and in a sufficient amount to provide a metal coating which will provide a surface resistivity of less than about 1 ohm/square both initially and after aging for at least one month.

4,556,588

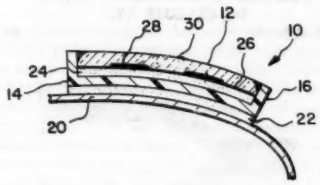
DECORATIVE EMBLEM USEFUL IN CUSTOMIZING AN AUTOMOBILE AND OTHER SURFACES

Clyde R. Rockwood, Columbus, Ohio, assignor to The D. L. Auld Company, Columbus, Ohio

Filed Aug. 25, 1982, Ser. No. 411,410

Int. Cl.⁴ A47G *1/12*; B44C *1/26*; B32B *1/00*

U.S. Cl. 428—13 **7 Claims**



1. A decorative emblem sufficiently flexible to conform to the curvature of a non-planar surface by hand pressure along comprising:

a base member and a graphic-bearing inlay, said base member being formed from a hand deformable, molded plastic material and provided with a raised rim which completely surrounds and frames said inlay for retaining said inlay in position on said base member with the upper surface of said inlay exposed, said inlay including a foil member having a graphic on one surface thereof and having a translucent flexible plastic lens cap overlying said graphic; said graphic-bearing inlay being bonded to said base member and being sufficiently flexible so that it will remain bonded to said base member when said base member is deformed.

4,556,589

COMPOSITE MATERIAL OF PLASTICIZED POLYVINYL CHLORIDE COATED WITH ACRYLIC RESIN-FLUORINE-CONTAINING COPOLYMER TOP COAT

Wolfgang Neumann, Waldkraiburg; Hans-Jürgen Hendriock, Burghausen, and Herbert Fitz, Burgkirchen, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Feb. 22, 1985, Ser. No. 704,388

Claims priority, application Fed. Rep. of Germany, Feb. 22, 1984, 3406278; Dec. 7, 1984, 3444631

Int. Cl.⁴ B32B *27/00*

U.S. Cl. 428—35 **10 Claims**

1. A composite material which comprises

(a) a substrate layer composed essentially of plasticized polyvinyl chloride, and

(b) a top layer, applied to one or both sides of this substrate layer and composed of:

(b^1) 5 to 100% by weight of a mixture of acrylic resins composed of 5 to 60% by weight of plasticized polyvinyl chloride or an internally plasticized copolymer of vinyl chloride and—to bring the total up to 100% by weight, —an acrylic resin, and

(b^2) 0 to 95% by weight of a fluorine-containing copolymer containing 50 to 20% by weight of copolymerized units of vinylidene fluoride, 10 to 30% by weight of copolymerized units of hexafluoropropylene and copo-

lymerized units of tetrafluoroethylene, the proportion of the latter being at least 30% by weight in the copolymer, and copolymerized units of another fluoroolefin or fluoroalky vinyl ether in an amount of 0 to 5% by weight,

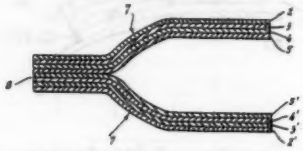
subject to the proviso that, if the content of the fluorine-containing copolymer (b^2) in the top layer is 0 to 15% by weight, there is also provided, on the latter, (c) a sealing layer which is solely composed of the fluorine-containing copolymer defined under (b^2).

4,556,590

LAMINATED PACKAGING MATERIAL

Laverne D. Martin, St. Paul, Minn., assignor to American Can Company, Greenwich, Conn.

Filed Jun. 11, 1984, Ser. No. 619,072
Int. Cl.[4] B32B *1/02*
U.S. Cl. 428—35 **16 Claims**



1. A laminated packaging material comprising

(a) as an outer layer, a transparent film of nylon primed on its inner surface with an acrylic latex, said primed surface being readily printable;

(b) a coextruded laminate of pigmented polyethylene and an ethylene acrylic acid copolymer, said coextruded laminate affixed to said transparent film with the pigmented polyethylene adjacent the primed surface of the transparent film;

(c) a metallic foil affixed to the ethylene acrylic acid copolymer of said coextruded laminate; and

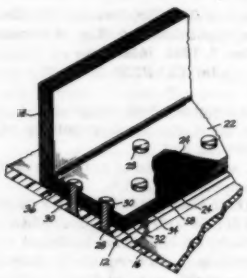
(d) a heat-sealable inner polyolefin containing layer affixed to said metallic foil.

4,556,591

CONDUCTIVE BONDED/BOLTED JOINT SEALS FOR COMPOSITE AIRCRAFT

Engbert T. Bannink, Jr., Auburn, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Sep. 25, 1981, Ser. No. 305,446
Int. Cl.[4] B65F *65/28*
U.S. Cl. 428—43 **10 Claims**



1. In an aircraft, composite plates formed of reinforced epoxy resin, said plates forming wall structures having bonded sealed joints, comprising:

adhesive bonding means forming a bonding seal between surfaces of overlapping wall structures to form a joint;

each wall structure plate being formed having layers of reinforcing fibers impregnated with epoxy resin to form multiple generally parallel laminations in the plates on the layers of fibers; and

the adhesive bonding means including conductive material and a resin mixed with thin fibers, the resin in the mixture being cured between the overlapping surfaces;

said conductive material forming a continuous conductive contact path within the bonding means and being substantially in the form of a thin discontinuous, approximate layer; the material being irregularly spaced by resin adjacent the continuous conductive contact path;

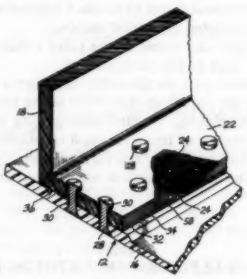
a sufficient amount of conductive material being present in the bonding means to weaken the bonding means so that the plates can be forcibly separated at the joint without structurally changing the laminations of the plates.

4,556,592

CONDUCTIVE JOINT SEALS FOR COMPOSITE AIRCRAFT

Engbert T. Bannink, Jr., Auburn, Wash., assignor to The Boeing Company, Seattle, Wash.

Continuation of Ser. No. 420,726, Sep. 21, 1982, abandoned, which is a division of Ser. No. 305,446, Sep. 25, 1981. This application Dec. 12, 1983, Ser. No. 561,122
Int. Cl.[4] B65D *65/28*
U.S. Cl. 428—43 **15 Claims**



1. For use in an aircraft having composite reinforced epoxy plates forming aircraft walls, each plate having layers of reinforcing fibers impregnated with epoxy to form a series of laminations, one lamination being along each layer, an adhesive seal for bonding and sealing overlapping faying surfaces of said plates to form joints between the plates,

said seal comprising:

conductive material and a resin mixed with thin fibers, the resin in the mixture being cured between the overlaping surfaces to bond and seal them together;

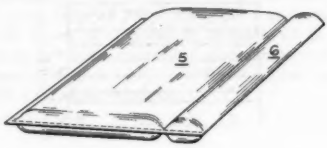
the conductive material structurally weakening the cured seal so that plates sealed and bonded together by the seal can be forcibly separated at a joint without structurally changing the laminations of the plates, whereby seals can be replaced without damaging the plates.

4,556,593

PANELS OF THERMAL INSULATION MATERIAL

John T. Hughes, Worcester, England, assignor to Micropore International Limited, Worchestershire, England

Filed Feb. 20, 1985, Ser. No. 703,536
Claims priority, application United Kingdom, Feb. 22, 1984, 8404602
Int. Cl.[4] B32B *1/04, 3/02, 5/16, 5/22*
U.S. Cl. 428—72 13 Claims



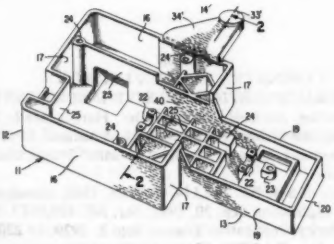
1. A panel of thermal insulation material comprising:
at least one rigid or substantially rigid main panel portion, said main panel portion comprising a dry particulate insulation material compressed within a porous envelope; and
at least one auxiliary panel portion secured to and extending along at least one edge of said at least one main panel portion, said at least one auxiliary panel portion comprising a substantially uncompressed dry particulate insulation material contained within an envelope.

4,556,594

SEWING MACHINE FRAME COMPRISING ORIENTED REINFORCED FIBERS

Robert Sedlatschek, Bridgewater, and Leo E. McGann, Cranford, both of N.J., assignors to The Singer Company, Stamford, Conn.

Division of Ser. No. 384,846, Jun. 4, 1982, Pat. No. 4,493,808. This application Sep. 18, 1984, Ser. No. 651,739
Int. Cl.[4] B32B *3/02, 1/00, 27/40*
U.S. Cl. 428—83 5 Claims



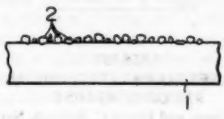
1. A molded article of fiber reinforced thermosetting composition, said molded article including a main section and extending from said main section a channel section having one open side, characterized in that the orientation of the reinforcing fibers in the vicinity of the juncture of the main and channel sections of said molded article are arranged largely parallel to the length of the channel section.

4,556,595

PRESSURE-SENSITIVE ADHESIVE SHEET STRUCTURE HAVING RELOCATABLE PROPERTIES

Katsura Ochi, Uozu, Japan, assignor to Nippon Carbide Kogyo Kabushiki Kaisha

Filed Jul. 13, 1982, Ser. No. 397,913
Claims priority, application Japan, Jul. 16, 1981, 56-109972
Int. Cl.[4] B32B *27/14, 27/04*
U.S. Cl. 428—143 13 Claims



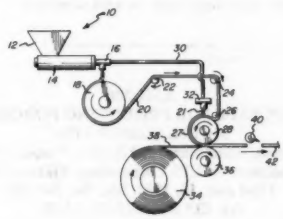
1. A pressure-sensitive adhesive sheet structure having relocatable properties comprising a pressure-sensitive adhesive layer and a layer of non-adhesive solid particles; said solid particles having a diameter smaller than the thickness of the adhesive layer and an average diameter of less than 10μ and said solid particles in said layer being randomly but uniformly distributed over the surface of the adhesive layer, wherein the ratio of the thickness in μ of the adhesive layer to the average diameter in μ of the solid particles is at least 2.

4,556,596

METHOD FOR ADHERING TENSIONED ELASTIC STRIPS TO A FLEXIBLE BASE MATERIAL AND ARTICLE PRODUCED THEREFROM

Michael G. Meuli, Menasha, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Filed Nov. 30, 1984, Ser. No. 676,920
Int. Cl.[4] A61F *13/16;* B32B *27/08, 31/08*
U.S. Cl. 428—152 12 Claims



1. An article comprising a flexible base material having one or more elasticized portions thereof provided by one or more composite strips of self-adhering elastic material adhered thereto, the composite strips comprising a first strip of self-adhering elastic material adhered to the base material by a second strip of self-adhering elastic material sandwiched between the first strip and the base material, and made by the steps of:
(a) tensioning a first strip of self-adhering elastic material to elongate it:
(b) joining a less-tensioned second strip of self-adhering elastic material to the elongated first strip to form a tensioned composite strip of self-adhering elastic material; and
(c) adhering the tensioned composite strip of self-adhering elastic material to the base material by joining at least the second strip to the base material.

4. A method of adhering one or more composite strips of self-adhering elastic material to a flexible base material to elasticize at least selected portions of the base material comprises:
tensioning a first strip of self-adhering elastic material to

elongate it whereby the strength of its inherent adhesion to the base material is reduced; joining a less-tensioned second strip of self-adhering elastic material to the elongated first strip to form a tensioned composite strip of self-adhering elastic material, the less-tensioned second strip having a greater strength of adhesion to the base material than the tensioned first strip; and

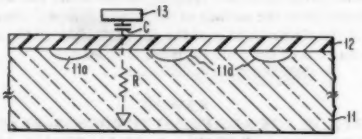
adhering the tensioned composite strip to the base material by joining at least the second strip to the base material.

4,556,597

ION DOPED SERVO PATTERN FOR MAGNETIC RECORDING DISK

John S. Best, San Jose, and David C. Bullock, Saratoga, both of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 22, 1983, Ser. No. 524,950
Int. Cl.⁴ G11B *5/82*
U.S. Cl. 428—201 **13 Claims**



1. A magnetic recording disk structure comprising:

a substrate, said substrate being made of a dopable material, said substrate having doped areas therein which modify the conductivity or permitivity of said substrate to form a capacitive track following servo pattern, and

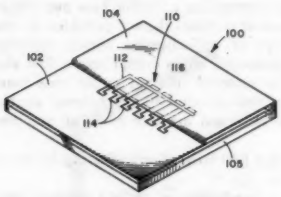
a magnetic recording layer on said substrate.

4,556,598

PORCELAIN TAPE FOR PRODUCING PORCELAINIZED METAL SUBSTRATES

Terry R. Bloom, Middlebury, and John F. Nespor, Elkhart, both of Ind., assignors to CTS Corporation, Elkhart, Ind.

Filed Jun. 16, 1983, Ser. No. 504,990
Int. Cl.⁴ B32B *15/00, 15/04*
U.S. Cl. 428—209 **8 Claims**



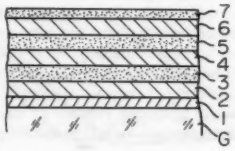
1. A porcelainized metal substrate, comprising an insulative glass layer bonded to said metal substrate, said insulative glass layer and metal substrate comprising the conjoint product of a mixture of glass frit and vehicle dried on flexible carrier tape, the mixture removed from said carrier tape, and adhered to said metal substrate by heated pressing, said metal substrate and insulative glass layer being the conjoint reaction product of firing said mixture and substrate to melt and bond said mixture to said substrate subsequently to said pressing.

4,556,599

HEAT REFLECTION FILM

Susumu Sato; Tadashi Hattori; Yoshiki Ueno, and Takashi Taguchi, all of Okazaki, Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Continuation of Ser. No. 495,606, May 18, 1983, abandoned.
This application Oct. 23, 1984, Ser. No. 664,396
Claims priority, application Japan, May 20, 1982, 57-86033
Int. Cl.⁴ G02B *5/22*; B32B *17/06*
U.S. Cl. 428—216 **7 Claims**



1. A heat-reflection film comprising:

a first layer formed on a base plate which is transparent for visible rays, the optical thickness of said first layer being approximately $\lambda/8$ or $3\lambda/8$, in which λ is a designed wavelength;

a plurality of intermediate layers from a second layer to a $(2n+2)$th layer, in which n is a positive integral number, the optical thickness of each intermediate layer being $\lambda/4$;

an uppermost $(2n+3)$th layer, the optical thickness of which is approximately $\lambda/8$,

wherein $n_g < n_1 < n_2$, in which n_g is the refractive index of said base plate, n_1 is the refractive index of said first layer, and n_2 is the refractive index of said second layer, the layers formed above said first layer being arranged in such a manner that high refractive index layers and low refractive index layers are alternately stacked, said second layer being arranged as a high refractive index layer;

said heat-reflection film including said layers and said base plate being constructed and arranged so as to have a reflection ratio for visible rays which is smaller than the reflection ratio for visible rays of said base plate; and

said heat-reflection film including said layers and said base plate being constructed and arranged so as to have a reflection ratio for infrared rays which is greater than the reflection ratio for infrared rays of said base plate.

4,556,600

LAMINATED GLASSES USING A NON-THERMOPLASTIC ADHESIVE INSERT LAYER

Franz Kraemling, Aachen; Achim Müller, Herzogenrath; Ludwig Linden, and Helmer Raedisch, both of Aachen, all of Fed. Rep. of Germany, assignors to Saint Gobain Vitrage, Courbevoie, France

Continuation of Ser. No. 182,114, Aug. 28, 1980, abandoned.
This application Sep. 30, 1982, Ser. No. 429,057
Claims priority, application France, Sep. 3, 1979, 79 22014
Int. Cl.⁴ B32B *27/40, 17/10, 31/20*
U.S. Cl. 428—216 **14 Claims**

1. A laminated glass having a non-thermoplastic adhesive insert layer comprsing a polyfunctional polyol component and a polyfunctional isocyanate component, wherein the polyol component is present in considerable excess and the numerical ratio of the isocyanate groups to the hydroxyl groups is between about 0.25 and 0.45.

4,556,601

HEAVY-WEIGHT NONWOVEN FABRIC OF HYDRAULICALLY-ENTANGLED FIBERS

Birol Kirayoglu, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jan. 5, 1984, Ser. No. 568,174
Int. Cl.[4] D04H *1/00*
U.S. Cl. 428—219 6 Claims

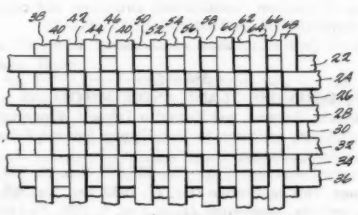
1. An improved heavy-weight, nonapertured, jet tracked nonwoven fabric consisting essentially of hydraulically entangled staple fibers of synthetic organic polymer, the improvement comprising the fabric having in combination a unit weight in the range of 200 to 850 g/m^2, a grab strength of at least 160 N/cm, a strip tensile strength of at least 0.26 (N/cm)/(g/m^2) and a resistance to disentanglement of at least 50 alternate extension cycles, said fabric not having been subjected to a shrinking operation.

4,556,602

REINFORCED PRIMARY BACKING FOR CARPET

Franklin E. Williams, Buena Vista, Va., assignor to Burlington Industries, Inc., Greensboro, N.C.

Continuation of Ser. No. 446,416, Dec. 2, 1982, abandoned. This application May 23, 1984, Ser. No. 613,745
Int. Cl.[4] B32B *5/16*
U.S. Cl. 428—259 4 Claims



1. A reinforced primary backing for tufted carpets, said backing having non-fibrillated polypropylene warp and weft yarns wherein polyester yarns are woven into the warp as a reinforcing yarn by substituting said polyester yarn for preselected warp yarn at predetermined spaced intervals, said polyester yarn being a noncrimped continuous filament without fibrillation having

(a) a denier of at least about 500,

(b) a tenacity of at least about 7.5 grams per denier, and

(c) an elongation at break point of less than about 25%.

4,556,603

METHOD OF MAKING LIGHTWEIGHT THERMOPLASTIC ELASTOMER AND PRODUCT THEREOF

Agmund K. Thorsrud, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Mar. 21, 1984, Ser. No. 591,755
Int. Cl.[4] C08K *3/40*
U.S. Cl. 428—283 26 Claims

1. A method of making a lightweight, thermoplastic elastomer composition comprising:

(a) mixing a solid thermoplastic elastomer and an extender oil at an elevated temperature to form a viscous liquid masterbatch; and, thereafter,

(b) mixing a hollow, microsphere particulate material and a dense, particulate filler with said masterbatch at an elevated temperature to form said lightweight, thermoplastic elastomer composition.

4,556,604

MAGNETIC RECORDING MEDIA

Nobuo Ohbayashi; Akiho Kawata; Shuichi Miya, and Teruhisa Niinuma, all of Gunma, Japan, assignors to Kanto Denka Kogyo Co., Ltd., Tokyo, Japan

Filed Sep. 6, 1984, Ser. No. 647,669
Claims priority, application Japan, Sep. 28, 1983, 58-179932
Int. Cl.[4] G11B *5/70*
U.S. Cl. 428—323 10 Claims

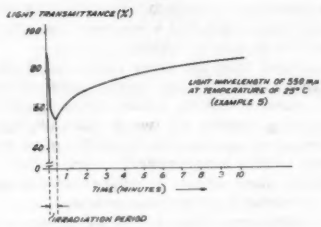
1. A magnetic recording medium consisting of a magnetic layer comprising particles of a magnetic powder material embedded in a matrix of a binder and a substrate carrying said magnetic layer, said magnetic layer further comprising a lubricant comprising a mixture of silicone oil and an amount of fluorinated graphite material effective to significantly enhance the lubricating effect of said lubricant.

4,556,605

PHOTOCHROMIC COATING COMPOSITION AND PHOTOCHROMIC SYNTHETIC RESIN OPHTHALMIC LENS

Takao Mogami, and Hiroshi Kawashima, both of Suwa, Japan, assignors to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed Sep. 7, 1983, Ser. No. 529,907
Claims priority, application Japan, Sep. 9, 1982, 57-156937; Sep. 10, 1982, 57-157852; Apr. 27, 1983, 58-74420; Apr. 28, 1983, 58-75887
Int. Cl.[4] B32B *27/08, 27/18;* G02B *5/23*
U.S. Cl. 428—331 18 Claims



1. A photochromic synthetic resin ophthalmic lens, comprising a synthetic resin lens body coated with a photochromic surface hard coating having a thickness between about 1 to 30μ, the surface hard coat formed from at least one organic silane compound which has been hydrolyzed, the silane compound having the general formula (1) as follows:

$$R^1{}_a\text{—}\overset{\displaystyle R^2{}_b}{\overset{|}{Si}}\text{—}(OR^3)_{4-a-b} \qquad (1)$$

wherein R^1 is an organic group containing at least one group selected from vinyl, propyl, butyl, amino, imino, epoxy, methacryloxy, glycidoxy, phenyl and SH group, R^2 is hydrogen, a hydrocarbon group having from one to six carbon atoms or a vinyl group, R^3 is a hydrocarbon group having from one to five carbon atoms, an alkoxyalkyl group having from one to five carbon atoms or an acyl group having from one to four carbon atoms, a is an integer 0, 1 or 2 and b is an integer 0 or 1 wherein the relation of a and b is $a+b \leqq 2$, and a photochromic material dispersed therein to provide a photochromic ophthalmic lens having improved abrasion resistance.

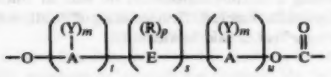
4,556,606
UV-STABILIZED COATED POLYESTER-CARBONATE ARTICLES AND PROCESS

Daniel R. Olson, Schenectady, N.Y., assignor to General Electric Company, Pittsfield, Mass.

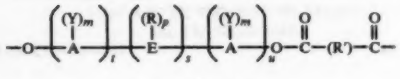
Filed Dec. 30, 1983, Ser. No. 566,979
Int. Cl.[4] B32B *9/04, 13/12;* B05D *3/02*
U.S. Cl. 428—412 22 Claims

1. An improved coated polyester-carbonate article exhibiting improved resistance to degradation by ultraviolet radiation comprising a polyester-carbonate substrate comprising at least two of the following four recurring units in the chain:

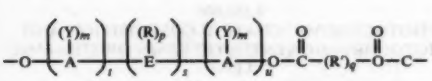
I



II

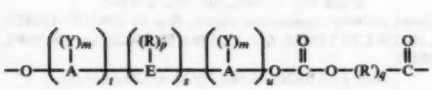


III



and

IV



wherein

R is a monovalent hydrocarbon radical having inert substituents thereon, such that when more than one R is used, they may be alike or different;

E is selected from the group consisting of alkylene and alkylidene residues, ether radicals, sulfur-containing radicals, carbonyl radicals, tertiary nitrogen radicals, silicon-containing radicals, and two or more alkylene or alkylidene groups separated by the residue of an aromatic nucleus, tertiary amino radicals, ether radicals, carbonyl radicals, silane radicals, or sulfur-containing radicals;

A is the residue of an aromatic nucleus;

Y is a substituent selected from the group consisting of inorganic atoms, inorganic radicals and organic radicals, each member of the group being inert to and unaffected by the reactant and by the reaction conditions;

m is a whole number including zero to a maximum equivalent to the number of replaceable nuclear hydrogens substituted on the aromatic hydrocarbon residue;

p is a whole number including 0 to a maximum determined by the number of replaceable hydrogens on E;

s is 0 or 1;

t is a whole number including 0;

u is a whole number including 0, such that when s is 0, either t or u may be 0 and not both;

R' is selected from the group consisting of alkylenes, alkylidenes and cycloaliphatic groups in the same manner as set out for R; an alkylene, alkylidene or cycloaliphatic group containing ethylenic unsaturation; aromatic radicals; two or more aromatic groups connected through non-aromatic linkages; and alkyl radicals; and

q is 0 or 1,

said substrate having durably adhered thereon a coating composition wherein the improvement consists essentially of said coating having contained therein a UV absorber selected from the group consisting essentially of benzophenones and derivatives thereof and benzotriazoles and derivaties thereof.

4,556,607
SURFACE COATINGS AND SUBCOATS

Suri A. Sastri, 20 Bicentennial Dr., Lexington, Mass. 02173

Filed Mar. 28, 1984, Ser. No. 594,224
Int. Cl.[4] C23C *9/10, 5/00;* C09D *3/00*
U.S. Cl. 428—627 30 Claims

1. A multilayer coating for a substrate, said coating comprising:

(A) a subcoat layer which is bonded to said substrate, said subcoat being characterized by having a microcrystalline, single-phase, solid solution structure and having a composition comprising:

(a) about 20 to 70% by weight of at least 1 element from the group consisting of cobalt and nickel;

(b) about 8 to 35% by weight of chromium;

(c) about 3 to 20% by weight of at least one element from the group consisting of molybdenum and tungsten; and

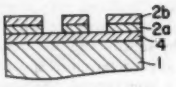
(d) about 0.5 to 10% by weight of at least one element from the group consisting of carbon, nitrogen and boron; and

(B) an outer coating layer bonded to said subcoat, said outer coating comprising at least 50% by weight of a material selected from the group consisting of nitrides, carbides and borides of titanium, hafnium and zirconium and combinations thereof.

4,556,608
PHOTOMASK BLANK AND PHOTOMASK

Satoru Kaneki, Sayama, and Kazuhiro Tabuchi, Tsurugashima, both of Japan, assignors to Dai Nippon Insatsu Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 306,377, Sep. 28, 1981, abandoned. This application Dec. 27, 1983, Ser. No. 565,611
Claims priority, application Japan, Oct. 9, 1980, 55-141565
Int. Cl.[4] B32B *9/00;* H01L *21/302*
U.S. Cl. 428—629 6 Claims



1. A photomask consisting essentially of: a transparent substrate, a metallic film of a translucent and electroconductive material selected from the group consisting of Nb, Ta and V formed on the substrate, and a masking film consisting essentially of (a) a layer of metallic chromium and (b) a layer of chromium oxide superposed thereon.

4,556,609
HEAT-RESISTANT GALVANIZED IRON ALLOY WIRE

Ken-ichi Sato; Satoshi Takano, and Kenji Miyazaki, all of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Dec. 23, 1983, Ser. No. 564,876
Claims priority, application Japan, Dec. 24, 1982, 57-234317
Int. Cl.[4] C23C *1/02*
U.S. Cl. 428—659 10 Claims

1. A heat-resistant galvanized iron alloy wire, comprising:

an iron alloy wire core; and

a coating formed on the periphery of the iron alloy wire core, the coating consisting essentially of a Zn-Al alloy consisting essentially of 0.2 to 1.0 wt % of Al and the balance of Zn and inevitably entrained impurities,

wherein the wire core is comprised of an Fe-Ni type alloy containing 35–42 wt % of Ni.

4,556,610

FLEXIBLE GRAVURE SLEEVE

Jan H. van Heuvelen, Losser, Netherlands, assignor to Twentse Graveerindustrie B.V., Enschede, Netherlands

Filed Apr. 14, 1983, Ser. No. 484,869

Claims priority, application Netherlands, Apr. 16, 1982, 8201600

Int. Cl.⁴ B41F *9/00, 13/08*

U.S. Cl. 428—666 5 Claims

1. A flexible gravure sleeve having a cylindrical outer surface and slightly conical inner surface, the sleeve having a small internal diameter end and a large internal diameter end, which sleeve, going from the inside to the outside, comprises

(a) a layer of nickel having a uniform thickness of 50–500 microns,

(b) an intermediate layer of copper nonstrippably adhered to the nickel layer, said intermediate layer having a Vickers hardness of not more than 130 VPN and having a slightly conical inner surface and a cylindrical outer surface, the intermediate layer of copper comprising a thin uniform adhesive layer deposited directly on the nickel layer and a layer of copper deposited on the adhesive layer and containing a polisher, and

(c) an outer layer of copper carrying a gravure pattern, the outer layer of copper being nonstrippably adhered to the intermediate layer and having a Vickers hardness of at least 150 VPN and a thickness of 30–100 microns.

4,556,611

MAGNETIC RECORDING MEDIUM

Kaoru Nakajima, Izumi, Japan, assignor to Sony Corporation, Tokyo, Japan

PCT No. PCT/JP83/00006, § 371 Date Sep. 9, 1983, § 102(e) Date Sep. 9, 1983, PCT Pub. No. WO83/02519, PCT Pub. Date Jul. 21, 1983

PCT Filed Jan. 10, 1983, Ser. No. 537,397

Claims priority, application Japan, Jan. 10, 1982, 57-4355

Int. Cl.⁴ G11B *5/70*

U.S. Cl. 428—694 4 Claims

1. A magnetic recording medium including:

a non-magnetic substrate,

a magnetic layer secured to said substrate, said magnetic layer including a binder and magnetic particles dispersed therein, said binder consisting essentially of a modified organic resin capable of generating free radicals when exposed to irradiation without degradation and having a molecular weight originally of from 10,000 to 100,000, said binder including a modified polymer produced by graft polymerization of said organic resin with a nitrogen-containing polymerizable unsaturated compound, said nitrogen-containing polymerizable unsaturated compound being present in an amount of from 0.1 to 10 parts by weight per 100 parts by weight of said organic resin, said graft polymerization being carried out by application of a graft-polymerization dosage of said irradiation.

4,556,612

RESEALABLE VENT VALVE FOR A RECHARGEABLE BATTERY

William C. Thibault, Melrose, and Robert C. Fowler, Gainesville, both of Fla., assignors to General Electric Company, Gainesville, Fla.

Filed Dec. 5, 1984, Ser. No. 678,525

Int. Cl.⁴ H01M *2/12*

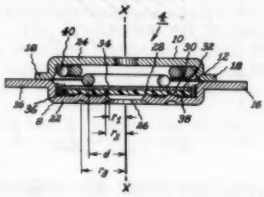
U.S. Cl. 429—54 14 Claims

1. A resealable pressure relief valve for venting to atmosphere at least a portion of the gas from the interior of a rechargeable electrochemical cell when the pressure of said gas in said cell is excessively high and for sealing said interior from said atmosphere when said pressure is not excessively high, said relief valve comprising:

an outer cover plate;

an inner base plate spaced from said cover plate to form a central cavity therebetween communicating with said atmosphere, said inner base plate having an orifice therethrough and further having a first sealing seat entirely surrounding said orifice and a second sealing seat entirely surrounding said first sealing seat;

a fluid path communicating said cell interior with said cavity and said atmosphere, said path extending through said orifice past said first and second sealing seats and through said cavity and said cover plate;



a seal member disposed within said cavity adjacent said inner base plate, said seal member moveable from a first position in abutting sealing engagement with each of said sealing seats to respectively effect first and second seals each obstructing the passage of fluid through said fluid path to a second position spaced from each of said sealing seats to permit the passage of said gas through said fluid path and past said first and second sealing seats; and

resilient means disposed within said cavity for biasing said seal member into said abutting sealing engagement with each of said first and second sealing seats.

4,556,613

RESISTANT GLASS IN GLASS-METAL SEAL AND CELL TERMINAL STRUCTURE FOR LITHIUM ELECTROCHEMICAL CELLS

Alwyn H. Taylor, Wellesley Hills; Wayne L. Lees, Lexington, and Michael L. Cook, Sharon, all of Mass., assignors to Duracell Inc., Bethel, Conn.

Continuation of Ser. No. 54,493, Jul. 3, 1979, abandoned. This application Dec. 22, 1980, Ser. No. 219,412

Int. Cl.⁴ H01M *2/08*

U.S. Cl. 429—101 11 Claims

1. A non-aqueous electrochemical cell having an anode comprised of a member of the group consisting of alkali metals, alkaline earth metals and aluminum, said cell being hermetically sealed with a metal-glass-metal seal wherein said glass consists essentially of a member of the group consisting of aluminosilicate glass and glass consisting essentially of alumina and oxides more stable than alumina, wherein said cell contains a lithium anode and wherein said cell contains a cathode depolarizer selected from the group consisting of sulfur dioxide and thionyl chloride.

4,556,614

METHOD OF PRODUCING A POLYMER BASED SOLID ELECTROLYTE FOR AN ELECTROCHEMICAL CELL

Alain le Méhauté, Gif sur Yvette; Thierry Hamaide, Lyons; Gilles Crépy, Evry, and Georges Marcellin, Vigneux sur Seine, all of France, assignors to Compagnie Generale d'Electricite, Paris, France

Filed Nov. 4, 1982, Ser. No. 439,003

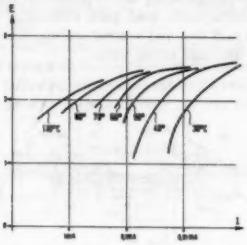
Claims priority, application France, Nov. 3, 1981, 81 20568

Int. Cl.⁴ H01M *6/16, 6/18, 4/88*

U.S. Cl. 429—191 20 Claims

1. A method of producing a solid electrolyte for an electrochemical cell, comprising mixing at least one first complexing polymer having in its monomer pattern at least one hetero atom and having at least one ionizable alkaline salt complexed therein with at least one second polymer miscible with the said

complexing polymer and having cross-linkable functions and said second polymer being selected from the group consisting of acrylic polybutadiene nitrile elastomers, methyl polyethylene acrylate elasters, elastomer polyesters and polyglymous



polymers grafted onto styrene, then physically cross-linking said cross-linkable functions while bringing the complexing polymer to an essentially amorphous state during said physical cross-linking.

4,556,615

SOLID STATE ELECTROCHEMICAL CELL

Dennis J. Bannister, Wakefield, England, assignor to United Kingdom Atomic Energy Authority, London, England

Continuation of Ser. No. 482,165, Apr. 5, 1983, abandoned. This application Nov. 27, 1984, Ser. No. 675,266

Claims priority, application United Kingdom, Apr. 16, 1982, 8211145

Int. Cl.⁴ H01M *6/16*

U.S. Cl. 429—192 **6 Claims**

1. A solid state electrochemical cell comprising an anode having at least one alkali metal as its active material, a cathode, and an electrolyte comprising a salt the anion of which salt is a polymer wherein an anionic group is covalently bonded to the polymer chain and is thereby at least partially immobilised, and the cation of which salt is an electrochemically active ion of at least one alkali metal.

4,556,616

TETRAKIS TRIALKYL SILOXY ALANATES OF ALKALI METALS, THEIR SOLID SOLUTIONS WITH PLASTIC MATERIALS AND THEIR USE FOR THE CONSTITUTION OF CONDUCTOR ELEMENTS FOR ELECTROCHEMICAL GENERATORS

Michel B. Armand, Nancy, France, and Fouzia El Kadiri Cherkaoui el Moursli, Sale, Morocco, assignors to Agencie Nationale de Valorisation de la Recherche, Paris and Societe Nationale Elf Aquitaine, Courbevoie, both of, France

Filed Jun. 1, 1983, Ser. No. 500,194

Claims priority, application France, Jun. 1, 1982, 82 09539

Int. Cl.⁴ H01M *6/18*

U.S. Cl. 429—192 **28 Claims**

1. An ionic compound of the formula:

$$[AlO_4(SiR_3)_4]^- M^+$$

in which:

R is an aprotic hydrocarbon group and at least one R is an aralkyl group, and

M is an alkali metal.

4,556,617

ANHYDROUS PRIMARY BATTERY

Franz J. Kruger, Half Moon Bay, Calif., assignor to Raychem Corporation, Menlo Park, Calif.

Filed Jun. 26, 1984, Ser. No. 624,647

Int. Cl.⁴ H01M *6/14, 4/60*

U.S. Cl. 429—196 **13 Claims**

1. An anhydrous primary battery comprising an anode; an inorganic liquid electrolyte comprising an electrolyte salt in a solvent selected from the group consisting of oxyhalides and thiohalides; and a substantially pure cathode material selected from the group consisting of polyacetylene, polypyrrole, polyparaphenylene, polyparaphenylenesulfide, and their derivatives.

4,556,618

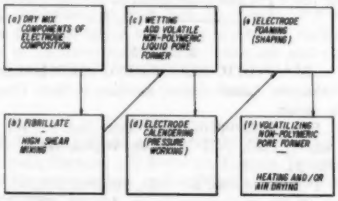
BATTERY ELECTRODE AND METHOD OF MAKING

George A. Shia, North Tonawanda, N.Y., assignor to Allied Corporation, Morris Township, Morris County, N.J.

Filed Dec. 1, 1983, Ser. No. 556,826

Int. Cl.⁴ B29D *27/00;* **H01M** *4/58, 4/62*

U.S. Cl. 429—217 **11 Claims**


(a) DRY MIX COMPONENTS OF ELECTRODE COMPOSITION
(c) WETTING ADD VOLATILE NON-POLYMERIC LIQUID PORE FORMER
(e) ELECTRODE FOAMING (SHAPING)
(b) FIBRILLATE HIGH SHEAR MIXING
(d) ELECTRODE CALENDERING (PRESSURE WORKING)
(f) VOLATILIZING NON-POLYMERIC PORE FORMER
HEATING AND/OR AIR DRYING

1. A method of producing a porous conductive battery electrode comprising blending an electrode-active solid material with from about 0.5 to about 10 percent by weight of a fibrillatable fluoropolymer and with from about 30 to about 60 percent by weight of a wetting, volatile, substantially non-polymeric, pore-forming liquid, subjecting the blend to a shearing process until the blend in converted into a self-sustaining cohesive mass in which the electrode-active material is wholly bound by the fibrillated fluoropolymer; and is intimately wetted by said non-polymeric liquid, forming said blend into the desired shaped electrode, and imparting porosity to said electrode without disrupting said formed shape by volatilizing said non-polymeric liquid from the shaped electrode.

10. A product made by the method of claim 1.

4,556,619

NEGATIVE-TYPE ACETALIZED POLYVINYL ALCOHOL RESIST SENSITIVE TO IONIZING RADIATION

Naoya Ogata, Kamakura; Kohei Sanui; Chiaki Azuma, both of Tokyo; Hozumi Tanaka, Funabashi; Kiyoshi Oguchi, Sayama; Yoichi Takahashi, Urawa, and Tomihiro Nakada, Kodaira, all of Japan, assignors to Dai Nippon Insatsu Kabushiki Kaisha, Japan

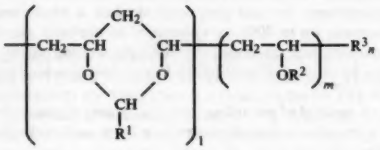
Filed Oct. 5, 1982, Ser. No. 432,865

Claims priority, application Japan, Sep. 3, 1982, 57-152645

Int. Cl.⁴ G03C *1/71*

U.S. Cl. 430—17 **4 Claims**

1. A negative-type resist cross-linked by exposure to ionizing radiation, which comprises a cross-linked acetalized polyvinyl alcohol polymer having a molecular weight of 10,000 to 1,000,000 represented by the formula:



wherein: R^1 represents an aromatic ring having halogen substitution; R^2 represents a hydrogen atom, which may partially be substituted by an acetyl group; R^3 being absent or if present, being a monomeric unit copolymerizable with vinyl acetate; and l, m, n are integers indicating polymerization degrees.

4,556,620

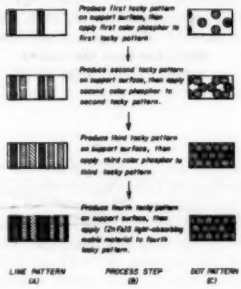
IMAGE DISPLAY INCLUDING A LIGHT-ABSORBING MATRIX OF ZINC-IRON SULFIDE AND METHOD OF PREPARATION

Robert P. Thompson, Millersville, Pa., assignor to RCA Corporation, Princeton, N.J.

Division of Ser. No. 565,284, Dec. 27, 1983. This application Jan. 16, 1985, Ser. No. 691,896

Int. Cl.[4] B05D *3/06*

U.S. Cl. 430—25 **7 Claims**



1. A method for making a viewing screen that includes a light-absorbing matrix adjacent spaced elemental image areas, said method comprising:

(a) producing on a major surface of a viewing window a layer which is tacky in substantially the pattern of said matrix, and

(b) contacting powder of light-absorbing material on said layer whereby particles of said powder adhere to said layer, said powder consisting essentially of crystalline zinc-iron sulfide particles, and thereby producing said matrix.

4,556,621

ELECTROPHOTOGRAPHIC RECORDING MATERIAL CONTAINING A METAL-1,3-DIKETONE COMPLEX

Gerhard Hoffmann, Otterstadt, and Peter Neumann, Wiesloch, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Jun. 29, 1984, Ser. No. 625,970

Claims priority, application Fed. Rep. of Germany, Jul. 5, 1983, 3324089

Int. Cl.[4] G03G *5/04, 13/28*

U.S. Cl. 430—49 **10 Claims**

1. An electrophotographic recording material which comprises an electrically conductive base and, applied on this, an organic photoconductor layer containing one or more binders, one or more charge carrier-producing compounds or sensitizers, one or more charge carrier-transporting compounds and, in addition, from 0.5 to 30% by weight, based on the amount of binder, of a metal-1,3-diketone complex.

4,556,622

ELECTROPHOTOGRAPHIC RECORDING MATERIAL WHOSE PHOTOCONDUCTOR LAYER CONTAINS A HALOGENATED PERYLENE DYE SENSITIZER

Peter Neumann, Wiesloch; Karl-Heinz Etzbach, Frankenthal, and Gerhard Hoffmann, Otterstadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Rheinland-Pfalz, Fed. Rep. of Germany

Filed Nov. 2, 1984, Ser. No. 667,730

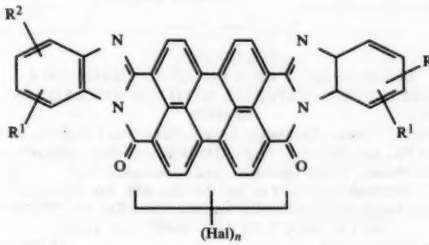
Int. Cl.[4] G03G *5/04*

U.S. Cl. 430—58 **13 Claims**

1. An electrophotographic recording material, consisting essentially of:

(A) an electrically conductive base; and

(B) a 0.8–40 μm thick photoconductor layer, wherein said layer (B) essentially contains (a) a polymeric binder which itself is capable of transporting charge carriers or contains at least one low molecular weight charge-transporting compound, and (b) at least one sensitizer of the formula:



where R^1 is hydrogen or C_1–C_8-alkyl, R^2 is C_1–C_8-alkyl, Hal is chlorine or bromine and n is an integer from 2 to 6, the concentration of (b) being from 0.5 to 10% by weight, based on (a+b), and (b) being dissolved in the binder to give a molecular-disperse solution.

4,556,623

ELECTROCONDUCTIVE POROUS FILM AND PROCESS FOR PRODUCING SAME

Shohei Tamura, Kanagawa; Sadamitsu Sasaki, Osaka; Takeshi Sasaki, Osaka; Hisashi Ichinose, Osaka; Keiji Nakamoto, Osaka; Masao Abe, Osaka, and Hitoshi Nakazawa, Osaka, all of Japan, assignors to Nitto Electric Industrial Co., Ltd., Osaka, Japan

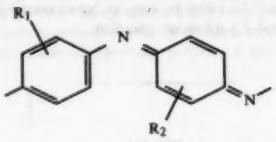
Filed Dec. 31, 1984, Ser. No. 688,119

Claims priority, application Japan, Dec. 30, 1983, 58-252135; Jan. 11, 1984, 59-4121; Jan. 11, 1984, 59-4122; Nov. 1, 1984, 59-231848

Int. Cl.[4] G03G *5/07*

U.S. Cl. 430—83 **13 Claims**

1. An electroconductive porous film comprising a porous film substrate having deposited thereon an electroconductive organic polymer containing an electron acceptor as a dopant, said polymer being a substantially linear polymer having as a main repeating unit thereof a quinonediimine structure represented by formula (III)



(III)

wherein R_1 and R_2, which are the same or different, each represents a hydrogen atom or an alkyl group.

4,556,624

TONER COMPOSITIONS WITH CROSSLINKED RESINS AND LOW MOLECULAR WEIGHT WAX COMPONENTS

Robert J. Gruber, Pittsford; Ronald J. Koch, Webster; John F. Knapp, Fairport, and Steven B. Bolte, Rochester, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Sep. 27, 1984, Ser. No. 655,381

Int. Cl.[4] G03G *9/00*

U.S. Cl. 430—110 **30 Claims**

1. An improved positively charged electrostatic toner composition consisting essentially of a polyblend mixture with from about 5 percent by weight to about 80 percent by weight of a crosslinked copolymer composition, and from about 20 percent by weight to about 95 percent by weight of a second thermoplastic polymer, pigment particles, a wax component of a molecular weight of from 500 to about 20,000, and a charge enhancing additive.

4,556,625

DEVELOPMENT OF A COLORED IMAGE ON A CELLULOSIC MATERIAL WITH MONOSULFONYL AZIDES

Ronald S. Lenox, Lancaster; Anne L. Schwartz, Columbia, both of Pa., and Charles E. Hoyle, Hattiesburg, Miss., assignors to Armstrong World Industries, Inc., Lancaster, Pa.

Continuation-in-part of Ser. No. 396,800, Jul. 9, 1982, abandoned. This application Nov. 25, 1983, Ser. No. 555,298

Int. Cl.[4] G03C *5/00, 5/18;* **D06P** *1/54, 1/642*

U.S. Cl. 430—145 **15 Claims**

1. A method of photolytically coloring a cellulosic material by contacting a surface thereof with a solution of poly(N-vinylcarbazole) and a solution of at least one monosulfonyl azide compound of the formula

$$R—SO_2N_3$$

wherein R is an aliphatic, aryl aliphatic or aryl radical which contains from 1 to about 25 carbon atoms, to thereby form an admixture on the treated surface of the material, and exposing the treated material to a UV-containing light source to thereby render the admixture solvent insoluble and to photolytically develop a color on the material.

9. The method of claim **1** wherein the treated surface is selectively exposed through a mask to the UV containing light source so that the surface will have exposed and unexposed areas.

4,556,626

NEGATIVE-WORKING DICHROMATE PHOTORESIST COMPOSITION, PROCESS FOR APPLYING IT TO A POLYMETHYL METHACRYLATE SURFACE, AND ARTICLE PRODUCED

Kenneth Speigel, Seneca Falls, N.Y., assignor to North American Philips Consumer Electronics Corporation, New York, N.Y.

Filed Aug. 24, 1983, Ser. No. 525,908

Int. Cl.[4] G03C *1/66, 1/76, 1/78*

U.S. Cl. 430—274 **17 Claims**

1. A negative-acting photoresist composition particularly adapted for forming a negative-acting photosensitive layer on a methacrylate polymer substrate, said composition consisting of an aqueous solution of polyvinyl alcohol, as a water-soluble photosensitizer for said polyvinyl alcohol, a photo-sensitive dichromate, up to 20% by volume of an aliphatic alcohol of 1–3 carbons and, as essentially the sole wetting agent, from 5–20% by volume of an aliphatic ketone having a boiling point below 130° C.

11. A method of providing a methacrylate polymer substrate with a negative-acting photosensitive layer, said method comprising:

(a) providing on a surface of a methacrylate polymer substrate, a thin negative-acting photosensitive layer consisting of an aqueous solution of polyvinyl alcohol, a water-soluble light-sensitive dichromate, up to 20% by volume of an aliphatic alcohol of 1–3 carbons and, as essentially the sole wetting agent, 5–20% by volume of an aliphatic ketone having a boiling point below 130° C.; and

(b) drying said thin layer at room temperature for 15–100 seconds to remove sufficient water to cause said layer to become immoble.

4,556,627

TRANSFERRING POLYMER FROM THIN PLASTIC FILMS TO PHOTODEVELOP INSULATION PATTERNS ON PRINTED WIRING BOARDS

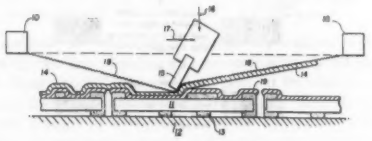
Donald F. Sullivan, 115 Cambridge Rd., King of Prussia, Pa. 19406

Continuation-in-part of Ser. No. 364,309, Apr. 1, 1982, Pat. No. 4,506,004. This application Apr. 13, 1984, Ser. No. 600,084

The portion of the term of this patent subsequent to Mar. 19, 2002, has been disclaimed.

Int. Cl.[4] G03C *5/00, 1/74*

U.S. Cl. 430—312 **11 Claims**



1. The method of producing printed circuit wiring boards having solder mask insulation thereon capable of photoimage development for establishing predetermined patterns overlying a portion of a conductive film pattern for defining electronic circuit wiring patterns adhered onto and forming ridges on an insulating substrate of the board, comprising the steps of,

transferrring from a carrier sheet surface a liquid photopolymer layer of substantially uniform thickness in adhering contact with the surface of the printed wiring board directly over the wiring pattern ridges with the photopolymer layer thickness sufficient to cover the ridges and adhering to the surface of the board in an air free bond,

thereafter transferring from a carrier sheet surface a covering layer of liquid photopolymer of substantially uniform thickness in an air free surface bond with the liquid photopolymer layer on the board,

Photo exposing the two layers through a phototool having a predetermined image pattern to produce a corresponding pattern of insoluble polymer adhered to the printed wiring board thereby to establish an insulation layer over the wiring pattern,

washing out the remaining soluble portions of the photopolymer to expose the portions of the wiring pattern uncovered by insulation, and partially pre-exposing the covering layer in position on the carrying sheet through an image pattern to harden the liquid photopolymer layer enough for improving the tenting characteristic for covering holes through the printed wiring bbard, and to cover

the liquid photopolymer layer on the ridges without substantial thinning out of the photopolymer on the ridges.

4,556,628
PROCESS FOR PRODUCING PRINTED CIRCUIT BOARDS WITH METALLIC CONDUCTOR STRUCTURES EMBEDDED IN THE INSULATING SUBSTRATE

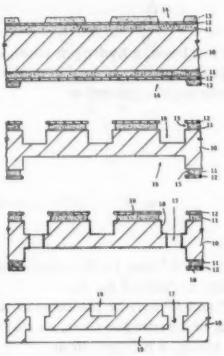
Johann Greschner, Pliezhausen; Friedrich W. Schwerdt, Herrenberg, and Hans J. Trumpp, Stuttgart, all of Fed. Rep. of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 13, 1984, Ser. No. 600,063

Claims priority, application European Pat. Off., May 19, 1983, 83104956.4

Int. Cl.⁴ G03C *5/00*

U.S. Cl. 430—314 **8 Claims**



1. A process for fabricating printed circuit boards having metallic conductor structures embedded in the front and back sides of an insulating substrate, said front and back sides being conductively connected by means of plated through holes, comprising the following process steps:

depositing a lift-off layer on the substrate and drying;

evaporating a metallic barrier layer on said lift-off layer and drying;

depositing any type of positive photoresist layer on said barrier layer and drying;

exposing said photoresist layer through an image mask;

developing said exposed photoresist layer to produce a negative mask image;

etching said mask image into said barrier layer;

etching said mask image into said lift-off layer;

vertically etching trenches into said substrate;

drilling through holes for connecting conductor structures on said first and second sides;

depositing a thin copper seed layer on the surfaces of said trenches, said through holes and said barrier layer;

removing said lift-off layer together with said barrier layer; and

depositing copper in said trenches and said through holes to a depth of at least 35 micrometers.

4,556,629
DEVELOPER COMPOSITION FOR POSITIVE PHOTORESISTS USING SOLUTION WITH CYCLIC QUATERNARY AMMONIUM HYDROXIDES

Susan B. Poulin, Woburn, and Ann B. Salamone, Marble Head, both of Mass., assignors to Morton Thiokol, Inc., Chicago, Ill.

Filed Dec. 21, 1983, Ser. No. 564,971

Int. Cl.⁴ G03C *5/34;* **C11D** *3/28, 3/30, 7/32*

U.S. Cl. 430—331 **10 Claims**

1. A positive photoresist developing composition consisting essentially of a solution of a cyclic quaternary ammonium hydroxide developing agent in which a quaternary substituted nitrogen is a member of an aromatic or nonaromatic ring of between 4 and 8 atoms; said developing agent being present in a concentration sufficient to act as a developing agent, the solution having a normality of the cyclic quaternary ammonium hydroxide between about 0.1 N and about 6.0 N.

4,556,630
COLOR PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Nobuo Furutachi; Kotaro Nakamura, and Takeshi Hirose, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

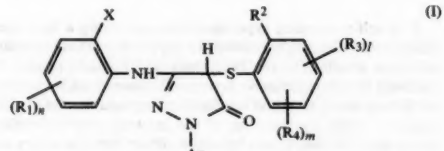
Filed Jun. 20, 1984, Ser. No. 622,805

Claims priority, application Japan, Jun. 20, 1983, 58-110596

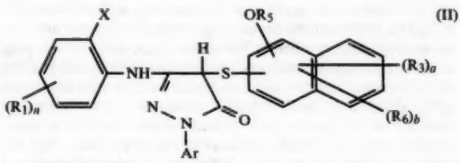
Int. Cl.⁴ G03C *7/40, 7/26*

U.S. Cl. 430—372 **26 Claims**

1. A silver halide color photographic light-sensitive material comprising a support having thereon at least one silver halide emulsion layer, the color photographic light-sensitive material having a photographic layer containing at least one kind of magenta coupler represented by the following general formula (I) or (II):



(I)



(II)

wherein Ar represents a phenyl group substituted with at least one of a halogen atom, an alkyl group, an alkoxy group, an alkoxy group, an alkoxycarbonyl group or a cyano group; X represents a halogen atom or an alkoxy group; R_1 represents hydrogen, a halogen atom, an alkyl group, an alkoxy group, an acylamino group, a sulfonamido group, a sulfamoyl group, a carbamoyl group, a diacylamino group, an alkoxycarbonyl group, an alkoxysulfonyl group, an aryloxysulfonyl group, an alkanesulfonyl group, an arylsulfonyl group, an alkylthio group, an arylthio group, an alkyloxycarbonylamino group, a ureido group, an acyl group, a nitro group or a carboxy group; R_2 represents a halogen atom, a hydroxy group, an amino group, an alkyl group, an alkoxy group or an aryl group; R_3 represents an unsubstituted amino group, an N-alkylamino group, an N,N-dialkylamino group, an N-anilino group, an N-alkyl-N-arylamino group or a heterocyclic amino group, an acylamino group, a ureido group, an alkoxycarbonylamino group, an imido group, a sulfonamido group, a sulfamoylamino group, a nitro group, an alkoxycarbonyl group, a carbamoyl group, an acyl group, a cyano group or an alkylthio group; R_4 represents hydrogen, a halogen atom, a hydroxy group, a straight chain or branched chain alkyl group, an aralkyl group, an alkenyl group, a cycloalkyl group or a cycloalkenyl group, an alkoxy group or an unsubstituted or substituted phenyl group having from 6 to 38 carbon atoms or an α- or β-naphthyl group, at least one of R_2 and R_4 represents an alkoxy group; n represents an integer of from 1 to 4; m is an integer of from 1 to 3; l is an integer of from 1 to 3; R_5 represents an alkyl group or an aryl group; R_6 represents hydrogen, a halogen atom, an

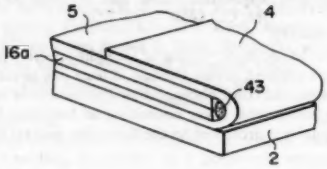
alkyl group, an alkoxy group or an aryl group; a is an integer of from 1 to 5; and b is an integer of from 1 to 5.

4,556,631

SELF-PROCESSING TYPE FILM UNIT AND METHOD OF MANUFACTURING THE SAME

Susumu Sato, and Yoshio Hara, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Aug. 20, 1982, Ser. No. 409,807
Claims priority, application Japan, Aug. 25, 1981, 56-132929
Int. Cl.⁴ G03C *5/54, 1/96*
U.S. Cl. 430—498 **2 Claims**



1. A self-processing type film unit comprising a base sheet bearing thereon a photosensitive layer, a masking member which is attached to the base sheet and has an opening for exposing the photosensitive layer on the base sheet, a transparent cover sheet attached to the masking member at its side edges to cover the opening of the masking member with a spacer member interposed between each of the side edges and the masking member, a developing solution container enclosed by the leading end portion of the masking member which is folded back around the developing solution container over the cover sheet and attached to the cover sheet, and a developing solution trapping member enclosed by the trailing end portion of the masking member which is folded back around the developing solution trapping member over the cover sheet and attached to the cover sheet, characterized in that a space formed between trailing end faces of the cover sheet and the spacer member, and the inner surface of the folded trailing end portion of the masking member at each side is closed.

4,556,632

COLOR LIGHT-SENSITIVE MATERIAL

Kozo Sato; Shinsaku Fujita; Koichi Nakamura, and Hideki Naito, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 22, 1984, Ser. No. 663,631
Claims priority, application Japan, Oct. 27, 1983, 58-201998
Int. Cl.⁴ G03C *1/40, 5/54*
U.S. Cl. 430—562 **18 Claims**

1. A color light-sensitive material comprising a support and at least one light-sensitive silver salt layer on the support, said layer containing a dye-providing compound represented by the following general formula (I):

$$(\text{Dye-X})_q\text{Y} \qquad \text{(I)}$$

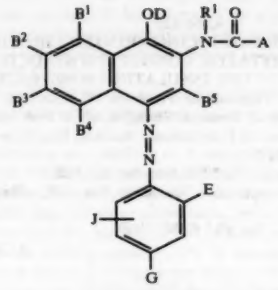
wherein Dye is a cyan dye group or dye precursor represented by general formula (II);

X is a bonding or connecting group;

Y is a group which releases Dye in a positive or negative relation to a latent image imagewise formed in a light-sensitive silver salt, the diffusibility of the Dye released being different from that of the compound of the general formula (I);

q is 1 or 2, and when q is 2, (Dye-X) may be the same or different; and

Dye is linked to X through any one of A, B^1, B^2, B^3, B^4, B^5, E, G and J of general formula (II):

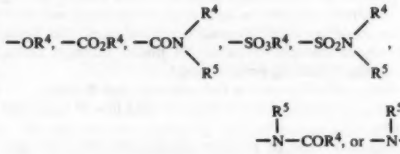


(II)

wherein A is a bond, a hydrogen atom, an alkyl group, a substituted alkyl group, an aryl group, a substituted aryl group, a heterocyclic group, or

wherein A^2 and A^3 may be the same or different and are each the same as defined for A;

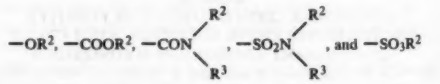
B^1, B^2, B^3, B^4 and B^5 may be the same or different, and are each a bond, or a hydrogen atom, an alkyl group, a substituted alkyl group, a halogen atom,



wherein R^4 and R^5 may be the same or different, and are each a hydrogen atom, an alkyl group, a substituted alkyl group, an aryl group, or a substituted aryl group; R^4 and R^5 may combine together to form a 5- or 6-membered ring;

D is a hydrogen atom or a group capable of reacting to form an O^- ion which is released under the action of a nucleophilic agent;

E and G may be the same or different and are each a bond, an alkylsulfonyl group, a substituted alkylsulfonyl group, a phenylsulfonyl group, a substituted phenylsulfonyl group, or a cyano group, wherein the substituent or substituents are selected from the group consisting of



wherein R^2 and R^3 are each a hydrogen atom, an alkyl group, or an aryl group;

J is a hydrogen atom, a halogen atom, or a cyano group; and

R^1 is a hydrogen atom, an alkyl group, or a substituted alkyl group.

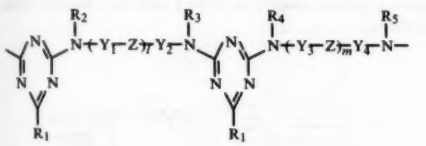
4,556,633

SILVER HALIDE COLOR LIGHT-SENSITIVE MATERIALS

Hatsumi Tanemura; Toshinao Ukai; Masaki Okazaki; Naoyasu Deguchi; Munehisa Fujita, and Kiyohiko Yamamuro, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Feb. 19, 1985, Ser. No. 702,754
Claims priority, application Japan, Feb. 17, 1984, 59-28134
Int. Cl.[4] G03C *1/28*
U.S. Cl. 430—573 11 Claims

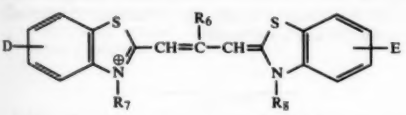
1. Silver halide color light-sensitive material which contains a compound having a repeating unit represented by general formula (I) and a compound represented by general formula (II):



(I)

wherein R_1 represents —OR, —SR or

wherein R and R′ each represents a hydrogen atom, an alkyl group, a hydroxylalkyl group, a sulfoalkyl group (or a salt thereof), a carboxyalkyl group (or a salt thereof), an aralkyl group, an aryl group, or a cycloalkyl group, or R and R′ may be bonded to form an akylene ring or an —O— containing alkylene ring; R_2, R_3, R_4 and R_5 each represents a hydrogen atom or an alkyl group; Y_1, Y_2, Y_3 and Y_4 each represents a polymethylene group, an arylene group or a cycloalkylene group; Z represents —O—, —SO_2— or —CH_2—; and l and m each represents 0 or 1;



(II)

$(Z_1)_{n-1}^{\ominus}$

wherein R_6 represents a hydrogen atom or an alkyl group; R_7 and R_8, which may be identical or different, each represents an alkyl group or an aryl group, but at least one of R_7 and R_8 is an alkyl group having an acid substituent; D and E, which may be identical or different, each represents a hydrogen atom, a halogen atom, an alkyl group, a hydroxyl group, an alkoxy group, an acyl group, an acyloxy group, an alkoxycarbonyl group, a carbamoyl group, a sulfamoyl group, a cyano group, a carboxyl group, a sulfo group, a trifluoromethyl group, a phenyl group or a benzene condensed ring, but at least one of D and E represents a hydroxyl group, an alkoxy group, an alkoxycarbonyl group or a carboxyl group; Z_1 represents an anion; and n represents 1 or 2, but n represents 1 when the dye forms an inner salt.

4,556,634

HIGH SENSITIVITY ASSAY METHOD

Hideo Misaki, and Masahiko Taniuchi, both of Shizuoka, Japan, assignors to Toyo Jozo Kabushiki Kaisha, Shizuoka, Japan

Filed Jun. 22, 1983, Ser. No. 506,844
Int. Cl.[4] C12Q *1/26, 1/32*
U.S. Cl. 435—25 17 Claims

1. In a high sensitivity assay method for a substance to be assayed, comprising

(1) converting the coenzyme corresponding to an amount of substance to be assayed, by the action of an oxide-reductase for the said substance, in the presence of coenzyme NAD^+ or NADH, or $NADP^+$ or NADPH;

(2) performing a cycling reaction by coenzyme cycling consisting of a combination of an oxido-reduction reaction which acts on excess substrate and coenzyme converted corresponding to the amount of the substnce to be assayed, and a conversion reaction from tetrazolium salt to formazan in the presence of diaphorase or electron transfer substance; and

(3) colorimetrically measuring the thus-formed formazan; the improvement comprising decomposing and neutralizing unreacted coenzyme at the end of said converting by adding a formic acid lower alkyl ester.

4,556,635

DETERMINATION OF ALCOHOL CONTENT IN WATER IMISCIBLE ORGANIC SYSTEMS

Donald O. Hitzman, and Thomas R. Hopkins, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 29, 1983, Ser. No. 527,540
Int. Cl.[4] C12Q *1/26;* C12N *11/02;* C12R *1/84*
U.S. Cl. 435—25 7 Claims

1. A process for the determination of the concentration of a C_1 to C_4 alcohol in an essentially water immiscible organic system having a solubility of less than about 5% (w/v) in water comprising the steps of:

(a) contacting a sample of the essentially water immiscible organic system containing less than about 0.01% (w/v) of said alcohol with alcohol oxidase immobilized on an electrode having a sensing area for measuring dissolved oxygen content, said alcohol oxidase being immobilized on the electrode with a hydratd support material layer bound to the sensing area of the electrode, said hydrated support material layer providing an aqueous phase containing the alcohol oxidase such that the alcohol in said water immiscible organic system can partition into the aqueous phase and be oxidized by oxygen in the aqueous phase, catalyzed by said alcohol oxidase; and

(b) thereafter determining the alcohol concentration in said essentially water immiscible organic system by measuring with said electrode the oxygen consumed by the oxidation of the alcohol partitioned into the aqueous phase, catalyzed by said alcohol oxidase.

4,556,636

COMPOSITION, ANALYTICAL ELEMENT AND METHOD FOR THE DETECTION OF BACTERIA

Robert T. Belly, Webster, and Laurie J. Clements, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 9, 1983, Ser. No. 502,815
Int. Cl.[4] C12Q *1/04*
U.S. Cl. 435—34 25 Claims

1. A composition for the detection of a bacterial microorganism, said composition comprising a metabolizable substrate and a benzindole dye selected from the group consisting of benz[cd]indole dyes, benz[e]indole dyes and benzy[g]indole dyes, provided said dye undergoes a detectable color change when incubated at 37° C. in admixture with an aqueous suspension of said bacterial microorganism.

4,556,637

IMMOBILIZED CHOLINESTERASE ENZYME PREPARATIONS AND A PROCESS FOR THE PREPARATION THEREOF

László Boross; Béla Szajáni, and Kamilla Kovacs, all of Budapest, Hungary, assignors to Reanal Finomvegyszergyar, Budapest, Hungary

PCT No. PCT/HU81/00047, § 371 Date Mar. 8, 1983, § 102(e) Date Mar. 8, 1983, PCT Pub. No. WO83/00345, PCT Pub. Date Feb. 3, 1983

PCT Filed Dec. 23, 1981, Ser. No. 486,286

Claims priority, application Hungary, Jul. 17, 1981, 2088/81

Int. Cl.[4] C12N *11/06, 11/08*

U.S. Cl. 435—181 **8 Claims**

1. An immobilized cholinesterase enzyme preparation, in which the cholinesterase enzyme is bound to a polymeric resin activated with a carbodiimide, said resin being built up from a first monomer selected from the group consisting of acrylic acid and methacrylic acid; a second monomer selected from the group consisting of acryl amide and methacryl amide; and a cross-linking agent selected from the group consisting of a compound having two acrylic moieties as terminal groups and a compound having two allyl moieties as terminal groups; and said polymeric resin containing at least 0.1 meq/g of —COOH functional groups.

3. A process for the preparation of an immobilized cholinesterase enzyme preparation, characterized in that a polymeric resin, built up from a first monomer selected from the group consisting of acrylic acid and methacrylic acid; a second monomer selected from the group consisting of acryl amide and methacryl amide; and a cross-linking agent selected from the group consisting of a compound having two acrylic moieties as terminal groups and a compound having two allyl moieties as terminal groups; and said polymeric resin containing at least 0.1 meq/g of —COOH functional groups, is treated with a carbodiimide derivative which is soluble in water or is soluble in an organic solvent at temperatures below 0° C., a solution of cholinesterase enzyme with a pH of 4.5 to 8.5 is applied to the resulting activated support, and the resulting product is washed.

4,556,638

MICROORGANISM CAPABLE OF DEGRADING PHENOLICS

Lewis J. Pillis, Roanoke, and Lois T. Davis, Salem, both of Va., assignors to Sybron Corporation, Rochester, N.Y.

Continuation of Ser. No. 372,775, Apr. 28, 1982, Pat. No. 4,447,539, which is a continuation of Ser. No. 229,025, Jan. 27, 1981, Pat. No. 4,352,886. This application Aug. 19, 1983, Ser. No. 524,631

The portion of the term of this patent subsequent to May 8, 2001, has been disclaimed.

Int. Cl.[4] C12N *1/20;* **C12R** *1/40*

U.S. Cl. 435—253 **1 Claim**

1. A microorganism *Pseudomonas putida* CB-173 having the identifying characteristics of ATCC-31800, said microorganism being capable upon culturing in wastewater containing phenolics of utilizing such as an assimilable source of carbon.

4,556,639

METHOD AND APPARATUS FOR DISLODGING CULTURED CELLS

Masao Izawa, and Sachiko Tatsukawa, both of Tokyo, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Mar. 4, 1983, Ser. No. 472,286

Claims priority, application Japan, Mar. 15, 1982, 57-40486

Int. Cl.[4] C12M *3/00, 1/00, 1/02;* **B01F** *11/00*

U.S. Cl. 435—284 **15 Claims**

1. A method for dislodging cultured cells, comprising:

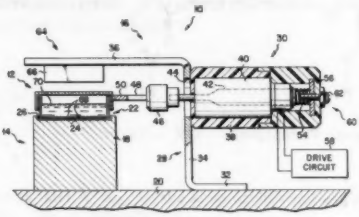
preparing a culture container which has a growing surface on which cultured cells are grown, treating the cultured cells with an enzyme solution, and filling the culture container with a culture solution to contact with the cultured cells;

supporting the culture container on supporting means so as to be reciprocally movable in a direction parallel to the growing surface;

applying an impact to the culture container by striking means to move the culture container in one direction parallel to the growing surface; and

bumping the culture container moving in said one direction against repulsive means to move the culture container in a direction opposite to said one direction, thereby applying an inertia force on the cultured cells in the direction parallel to the growing surface and dislodging the cultured cells from the growing surface.

3. An apparatus for disloding cultured cells from a growing surface of a culture container in which the cells have been implanted and grown on the growing surface and which also contains a culture solution in contact with the cultured cells, comprising:



supporting means for supporting a culture container to be reciprocally movable in a direction parallel to the growing surface; and

reciprocating means for reciprocally moving the culture container supported by the supporting means in the direction parallel to the growing surface so that an inertia force acts on the cultured cells in the direction parallel to the growing surface to dislodge the cultured cells from the growing surface;

said reciprocating means including striking means for applying an impact to the culture container supported by the supporting means in the direction parallel to the growing surface to move the culture container in one direction; and

said supporting means including repulsive means for repelling the culture container moving in said one direction to move the culture container in a direction substantially opposite to said one direction.

4,556,640

STABILIZED TEST COMPOSITION, DEVICE AND METHOD FOR THE DETERMINATION OF PEROXIDATIVELY ACTIVE SUBSTANCES

Mary Lou Gantzer, Elkhart, Ind., assignor to Miles Laboratories, Inc., Elkhart, Ind.

Filed Jun. 29, 1983, Ser. No. 508,836

Int. Cl.[4] G01N *33/52, 21/78*

U.S. Cl. 436—66 **9 Claims**

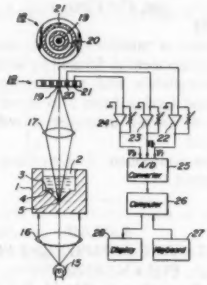
1. A test composition for the determination of a peroxidatively active substance in a test sample, the composition comprising an organic hydroperoxide, a benzidine indicator capable of providing a detectable response in the presence of the hydroperoxide and a peroxidatively active substance and an aniline chosen from phenyl-1-naphthylamine, N,N-dimethylaniline and mixtures thereof.

4,556,641

METHOD OF JUDGING A PARTICLE AGGLUTINATION REACTION AND A REACTION VESSEL FOR USE IN THE METHOD

Tokio Kano, Kunitachi, and Akira Tamagawa, Hino, both of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Oct. 29, 1982, Ser. No. 437,692
Claims priority, application Japan, Nov. 2, 1981, 56-176250
Int. Cl.[4] G01N *21/82, 33/54*
U.S. Cl. 436—165 9 Claims



1. A method of judging whether or not a particle agglutination reaction has occurred by detecting a particle pattern formed on a bottom surface of a reaction vessel containing a test liquid undergoing agglutination testing, comprising:

photoelectrically detecting a particle pattern formed on a flat substantially horizontal portion of the bottom surface of said reaction vessel to produce a first signal representing at least one of an amount of particles and a concentration of particles contained in the test liquid, said flat substantially horizontal portion of the bottom surface being positioned above and surrounding a centrally located inclined portion of the bottom surface;

photoelectrically detecting a particle pattern formed by particles decending upon said centrally located inclined portion of the bottom surface of said reaction vessel to produce a second signal representing the particle pattern of the test liquid; and

when said first signal is within predetermined upper and lower values, judging whether or not a particle agglutination reaction has occurred on the basis of said second signal, and when said first signal is outside said predetermined upper and lower values, judging whether or not a particle agglutination reaction has occurred on the basis of a corrected second signal, with the correction thereto being a function of the first signal.

4,556,642

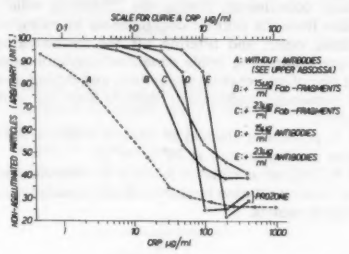
PARTICLE AGGLUTINATION ASSAY OF ANTIGENS

Daniel Collet-Cassart, Kraainem; Jean-Claude Mareschal, Malonne, and Pierre L. Masson, Brussels, all of Belgium, assignors to International Institute of Cellular & Molecular Pathology, Brussels, Belgium

Filed Aug. 4, 1983, Ser. No. 520,288
Claims priority, application United Kingdom, Aug. 6, 1982, 8222776
Int. Cl.[4] G01N *33/54, 33/68, 33/74*
U.S. Cl. 436—500 7 Claims

1. In a particle agglutination assay for an antigen (Ag) in a liquid sample, which comprises the steps of forming a reaction mixture of the liquid sample and finely divided particles bearing a reagent, the reagent being such as to bind with the Ag to cause agglutination of the particles; and measuring the extent of agglutination of the particles and therefrom determining the amount of Ag present;

the improvement comprising introducing in solution in the reaction mixture a predetermined sensitivity increasing amount of a substance which is univalent towards the Ag and which specifically binds therewith so that the Ag bound to the substance is unable to agglutinate the particles, the quantity of substance being insufficient to bind with all the Ag under assay, and wherein the amount of Ag is determined from the extent of agglutination and the quantity of substance used.



4,556,643

ASSAY METHOD AND PROBE FOR POLYNUCLEOTIDE SEQUENCES

Alan Paau, Middleton; Steven G. Platt, and Luis Sequeira, both of Madison, all of Wis., assignors to Agracetus, Middleton, Wis.

Continuation-in-part of Ser. No. 401,957, Jul. 26, 1982, abandoned. This application Feb. 1, 1983, Ser. No. 462,719
Int. Cl.[4] G01N *33/50, 33/54;* C12Q *1/68, 1/70, 1/29, 1/04, 1/06*
U.S. Cl. 436—501 24 Claims

1. A method for assaying for the presence of a specific nucleotide target sequence in a sample polynucleotide test extract comprising the steps of

(a) isolating the sample polynucleotide extract in a test sample;

(b) exposing the test sample to:

(1) a polynucleotide modified probe comprising a cDNA sequence substantially complementary to the specific nucleotide sequence and a protein binding nucleotide sequence, and

(2) a binding protein which specifically binds by a non-covalent bond to the binding sequence of the modified probe;

(c) isolating the test sample to remove any constituents not bound to the sample polynucleotide extract and

(d) conducting an assay of the test sample for the presence of the binding protein.

4,556,644

PROCESS FOR PURIFYING AND RECOVERING CONTAMINATED CATALYST SOLUTION OBTAINED IN THE CARBONYLATION OF METHYL ACETATE AND/OR DIMETHYLETHER

Heinz Erpenbach, Cologne; Klaus Gehrmann; Winfried Lork, both of Erftstadt, and Peter Prinz, Hürth, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Aug. 4, 1982, Ser. No. 405,070
Claims priority, application Fed. Rep. of Germany, Aug. 31, 1981, 3134347
Int. Cl.[4] B01J *31/40;* C07C *51/56, 51/54, 67/37*
U.S. Cl. 502—33 6 Claims

1. A process for purifying and recovering constituents from a contaminated catalyst solution which is obtained as a result of the carbonylation of methyl acetate, dimethylether or mixtures of methylacetate and dimethylether, the contaminated catalyst solution containing carbonyl compounds of noble metals of group VIII of the Periodic System of the elements, quaternary

heterocyclic aromatic nitrogen compounds or quaternary organophosphorus compounds as organic promoters, undistillable organic contaminants, and volatile constituents including acetic acid, acetic anhydride and ethylidene diacetate, which comprises: distillatively freeing the catalyst solution from the volatile constituents; freeing the remaining solid distillation residue from the organic contaminants by extraction with an aliphatic ether; and filtering off the remaining undissolved mixture comprising noble metal/carbonyl-compound, and at least one of said organic promoters, and drying and recycling said remaining undissolved mixture into the carbonylation reaction.

2. A process as claimed in claim 1, wherein the distillation residue is ether treated at 30° to 90° C.

5. A process as claimed in claim 1, wherein said contaminated catalyst solution further contains carbonyl compounds of non-noble metals.

4,556,645

ENHANCED CATALYST FOR CONVERSION OF SYNGAS TO LIQUID MOTOR FUELS

Peter K. Coughlin, Yorktown Heights, and Jule A. Rabo, Armonk, both of N.Y., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Jun. 27, 1984, Ser. No. 625,373
Int. Cl.[4] B01J *29/10, 27/14*
U.S. Cl. 502—66 **32 Claims**

1. A catalyst composition adapted for the enhanced conversion of synthesis gas comprising carbon monoxide and hydrogen to C_5+ hydrocarbon mixtures having enhanced suitability for use as liquid motor fuels comprising:

(a) a Fischer-Tropsch catalyst component; and

(b) a co-catalyst/support component comprising a crystalline, microporous silicoaluminophosphate, non-zeolitic molecular sieve catalyst,

whereby said catalyst composition is capable of enhancing the selectivity of said conversion to motor fuel range hydrocarbons and the quality of the resulting motor fuel product.

2. The composition of claim 1 in which said silicoaluminophosphate catalyst comprises SAPO-11.

3. The composition of claim 1 in which said silicoaluminophosphate catalyst comprises SAPO-31.

4. The composition of claim 1 in which said Fischer-Tropsch catalyst comprises cobalt.

10. The composition of claim 1 and including a steam-stabilized, hydrophobic zeolite Y additional co-catalyst/support component, said Fischer-Tropsch catalyst being supported mainly inside the crystals of said zeolite Y component.

4,556,646

MANUFACTURE OF NOBLE METAL/ZEOLITE CATALYSTS

Richard D. Bezman, Pt. Richmond, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Nov. 19, 1984, Ser. No. 672,772
Int. Cl.[4] B01J *29/12, 29/22*
U.S. Cl. 502—66 **20 Claims**

17. In a process for preparing a catalyst comprising alumina, LZ-20 zeolite, and palladium, which process comprises the steps of:

(a) forming a catalyst base containing the alumina and the LZ-20 zeolite;

(b) impregnating the catalyst base with an impregnating solution containing a salt of the tetra(ammine) palladium (II) ion; and

(c) drying and calcining the impregnated catalyst base; and the improvement which comprises:

(a') using as the impregnating solution in step (b) a solution which also contains a soluble ammonium salt; and

(b') allowing the impregnated base to stand, between steps (b) and (c), for a time sufficient to produce in the finished calcined catalyst a radial distribution of noble metal such that the concentration of noble metal at the center of the catalyst is at least about 30% of the concentration at the outside edges of the catalyst.

20. A catalyst prepared by the process of claim 17.

4,556,647

OLEFIN POLYMERIZATION

Gene H. C. Yeh; Joel L. Martin, and Henry L. Hsieh, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 650,034, Sep. 13, 1984. This application Feb. 25, 1985, Ser. No. 705,392
Int. Cl.[4] C08F *4/52*
U.S. Cl. 502—102 **11 Claims**

1. A polymerization catalyst system comprising

(1) a catalyst component A formed by admixing a rare earth metal hydroxyhalide and an electron donor bidentate organic ligand having from 2 to about 20 carbon atoms selected from among diamines, dihydric alcohols, and diketones, and

(2) a cocatalyst component B comprising an organoaluminum compound.

4,556,648

SOLID CATALYST COMPONENT FOR OLEFIN POLYMERIZATION

Kiyoshi Kawai, Toyonaka; Toshiyuki Kokubo, Ibaraki, and Yoshihiro Miyoshi, Takatsuki, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Aug. 10, 1984, Ser. No. 639,382
Claims priority, application Japan, Aug. 16, 1983, 58-150638
Int. Cl.[4] C08F *4/62, 4/64, 4/68*
U.S. Cl. 502—112 **26 Claims**

1. A solid catalyst component for olefin polymerization which is produced by reacting (A) a silicon compound selected from the group consisting of (1) halogen-containing silicon compounds, (2) silicon compounds having a monomer unit $—SiR^2R^3O—$ (wherein R^2 and R^3 may be same or different, R^2 is an alkyl group, an aryl group, a cycloalkyl group, an alkoxy group, or an aryloxy group and R^3 is an alkyl group, an aryl group, a cycloalkyl group, or a hydrogen atom and a polymerization degree of 2 to 10,000, (3) silanols represented by the general formula $R_l^4Si(OH)_{4-l}$ (wherein R^4 is an alkyl group, an aryl group, a cycloalkyl group or a hydrogen atom and l is 1, 2 or 3) or condensation products of said silanols, (4) silicon compounds represented by the general formula $R_m^5Si(OR)^6)_{4-m}$ (wherein R^5 is an alkyl group, an aryl group, a cycloalkyl group, an alkenyl group or a hydrogen atom, R^6 is an alkyl group, an aryl group or a fatty acid moiety and m is 1, 2 or 3), and (5) silicon compounds or polymers represented by the general formula $[SiO_a(OR^7)_b]n$ (wherein R^7 is an alkyl group, a cycloalkyl group, an aryalkyl group, an aryl group or a fatty acid moiety, a is a number defined by $0 \leqq a \leqq 1$, b is a number defined by $2 \leqq b \leqq 4$, number of and n is a 1 to 10,000) with (B) a compound of a transition metal of Groups IVa, Va and VIa of the periodic table to obtain a reaction mixture (I), reacting the reaction mixture (I) with (C) an organomagnesium compound selected from organomagnesium compounds or hydrocarbon-soluble complexes between an organomagnesium compound and an organometal compound capable of allowing said organomagnesium compound to be soluble in hydrocarbons to obtain an intermediate product (II), and contacting the intermediate product (II) with (D) an organoaluminum halide compound represented by the general formula $R_c^1AlX_{3-c}$ (wherein R^1 is an organic group containing 1 to 20 carbon atoms, X is a halogen and c is a number defined by $0<c<3$) and (E) an oxidative compound.

18. A solid catalyst component for olefin polymerization according to claim 1, wherein the oxidative component [component (E)] is a mixed gas between oxygen or ozone and nitrogen, argon or helium, benzoyl peroxide, lauryl peroxide, cumene peroxide, tert-butyl peroxide, chlorine, bromine, iodine, bromine chloride, or a mixture of at least two of these.

4,556,649

SUBSTITUTED MALONIC ACID DIAMIDE INSECTICIDES, COMPOSITIONS AND USE

Herbert Salzburg; Rudolf Fauss, both of Cologne; Kurt Findeisen, Odenthal, and Bernhard Homeyer, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

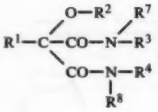
Filed Dec. 21, 1984, Ser. No. 684,570

Claims priority, application Fed. Rep. of Germany, Jan. 7, 1984, 3400401

Int. Cl.[4] A01N *37/20, 43/84;* C07C *103/24;* C07D *295/14*

U.S. Cl. 514—63 8 Claims

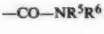
1. A Substituted malonic acid diamide of the formula



wherein

R^1 represents aryl or heteroaryl, each of which can optionally be substituted,

R^2 represents hydrogen or trialkylsilyl, and represents alkyl, cycloalkyl, alkenyl, alkinyl, aralkyl, alkylcarbonyl, arylcarbonyl, alkoxycarbonyl, aryloxycarbonyl, alkylsulphenyl, arylsulphenyl, alkylsulphonyl, arylsulphonyl, alkylaminosulphonyl, dialkylaminosulphonyl, arylaminosulphonyl or arylalkylaminosulphonyl, each of which can optionally be substituted, and represents radicals of the formula



wherein

R^5 and R^6 independently of one another represent hydrogen, alkyl, cycloalkyl, aryl, alkylaminocarbonyl, arylaminocarbonyl, alkylcarbonyl, arylcarbonyl, alkoxycarbonyl, aryloxycarbonyl, alkylsulphonyl or arylsulphonyl, it being possible for these radicals to be optionally substituted,

R^3 represents hydrogen or the radical R^4,

R^7 and R^8 independently of one another represent hydrogen, alkyl or aryl, and

R^4 represents a radical of the formula

and

R^9 represents hydroxyl, alkoxy or aryloxy, each of which can optionally be substituted, alkylamino, arylamino, aralkylamino, dialkylamino, diarylamino, cycloalkylamino, alkenylamino, or nitrogen-containing saturated heterocyclic radicals which are bonded via N and optionally contain further hetero atoms.

6. An insecticidal composition comprising an insecticidally effective amount of a compound according to claim 1 in admixture with a diluent.

4,556,650

PHOSPHONIC ACID ESTERS AS PESTICIDES

Junichi Saito, Mitaka; Akio Kudamatsu, Kawasaki; Toyohiko Kume, and Shinichi Tsuboi, both of Hino, all of Japan, assignors to Nihon Tokushu Noyaku Seizo K.K., Tokyo, Japan

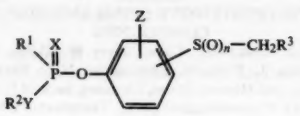
Filed Mar. 13, 1984, Ser. No. 589,209

Claims priority, application Japan, Mar. 18, 1983, 58-44315

Int. Cl.[4] C07F *9/40, 9/44;* A01N *57/14, 57/30*

U.S. Cl. 514—128 10 Claims

1. A phosphonic acid ester of the formula



in which

R^1 is C_{1-4}-alkyl, phenyl or naphthyl,

R^2 is C_{1-4}-alkyl or C_{1-4}-alkoxy-C_{1-4}-alkyl,

R^3 is fluoro-substituted C_{1-4}-alkyl,

X is an oxygen or sulfur atom,

Y is an oxygen or sulfur atom or a group of the formula

in which R^4 is a hydrogen atom or C_{1-4}-alkyl, and

Z is a hydrogen atom, a halogen atom or C_{1-4}-alkyl, and

n is 0 or 2.

2. A method of combating insects, mites and nematodes which comprises applying to the insects, mites and nematodes or to a habitat thereof, an insecticidally, miticidally and nematicidally effective amount of a compound according to claim 1.

4,556,651

SECALONIC ACID DERIVATIVES AS ANTITUMOR AGENTS

Mitsuru Shibukawa, Yokohama; Chisei Shibuya, Fuji, and Kunihiko Ishii, Numazu, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Japan

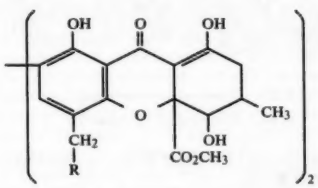
Division of Ser. No. 366,333, Apr. 7, 1982, Pat. No. 4,418,061. This application Sep. 6, 1983, Ser. No. 529,635

Claims priority, application Japan, Apr. 16, 1981, 56-56219; Apr. 25, 1981, 56-61916

Int. Cl.[4] C07D *407/04;* A61K *31/35*

U.S. Cl. 514—191 7 Claims

1. A secalonic acid compound having the formula;



(I)

wherein R is —NH—CO_2R_4, wherein R_4 is a saturated acyclic C_{1-22} alkyl group; an unsaturated acyclic alkyl up to C_{22}; a cyclohexyl group; a saturated acyclic C_{1-22} alkyl group substituted by an ethoxy group, a nitro group, a fluorine atom or 1 to 3 chlorine atoms; an unsaturated acyclic alkyl group up to C_{22} substituted by an ethoxy group, a nitro group, a fluorine atom or 1 to 3 chlorine atoms; a phenyl or nitrophenyl group; a benzyl group; and the pharmaceutically acceptable salts thereof.

4,556,652

ANTIHYPERTENSIVE SPIRO-AMIDOAMINO COMPOUNDS

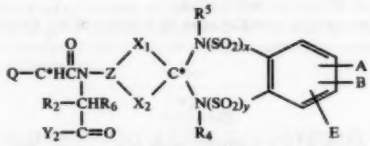
John T. Suh, Greenwich, Conn.; Jerry W. Skiles, Tuckahoe, N.Y.; John J. Piwinski, Parsippany, N.J.; Paul Menard, Tuckahoe, and Howard Jones, Ossining, both of N.Y., assignors to USV Pharmaceutical Corp., Tarrytown, N.Y.

Filed Mar. 2, 1984, Ser. No. 585,769

Int. Cl.[4] **A61K** *37/00;* **C07D** *279/00;* **C07C** *103/52*

U.S. Cl. 514—211 **26 Claims**

1. A compound of the formula (1)

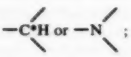


and its pharmaceutically acceptable acid addition, alkali metal, and alkaline earth metal salts, wherein

Q is Y_1—C(O)—C*H(R_1)—NH—, —NH_2, R_1—C(O)—S—C*H(R_1))$_{0-1}$—, or HS—(C*H(R_1))$_{0-1}$—;

Y_1 and Y_2 are independently —OH, —OR, or —NR_1R_2;

Z is

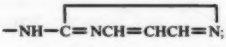


one of x and y is 1 and the other is 0;

R is independently hydrogen, alkyl having 1 to 8 carbon atoms, aryl having up to 12 carbon atoms, aryl-alkyl wherein the aryl moiety has up to 10 carbon atoms and the alkyl moiety has 1 to 6 carbon atoms, cycloalkyl having 3 to 10 carbon atoms, fused cycloalkylaryl having 8 to 12 carbon atoms, heterocyclic, or an amino-substituted alkyl group having 1 to 6 carbon atoms;

R_1 is independently hydrogen, alkyl having 1 to 8 carbon atoms, aryl having up to 12 carbon atoms, aryl-alkyl wherein the aryl moiety has up to 10 carbon atoms and the alkyl moiety has 1 to 6 carbon atoms, cycloalkyl having 3 to 10 carbon atoms, fused cycloalkylaryl having 8 to 12 carbon atoms, heterocyclic, or an amino-substituted alkyl group having 1 to 6 carbon atoms;

R_2 is independently hydrogen, alkyl having 1 to 8 carbon atoms, aryl having up to 12 carbon atoms, aryl-alkyl wherein the aryl moiety has up to 10 carbon atoms and the alkyl moiety has 1 to 6 carbon atoms, cycloalkyl having 3 to 10 carbon atoms, fused cycloalkylaryl having 8 to 12 carbon atoms, heterocyclic, or an alkyl group having 1 to 6 carbon atoms which is substituted with —NH_2, —N—H—C(NH_2)═NH, or



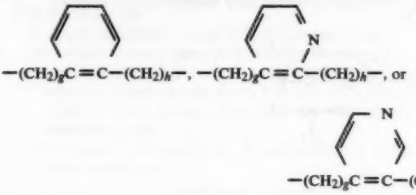
R_3 is —OH, phenyl, or an alkyl or alkoxy group having up to 6 carbon atoms;

R_4 and R_5 are independently hydrogen, alkyl having 1 to 8 carbon atoms, aryl having up to 12 carbon atoms, aryl-alkyl wherein the aryl moiety has up to 10 carbon atoms and the alkyl moiety has 1 to 6 carbon atoms, cycloalkyl having 3 to 10 carbon atoms, fused cycloalkylaryl having 8 to 12 carbon atoms, heterocyclic, or an amino-substituted alkyl group having 1 to 6 carbon atoms;

R_6 is independently hydrogen, alkyl having 1 to 8 carbon atoms, aryl having up to 12 carbon atoms, aryl-alkyl wherein the aryl moiety has up to 10 carbon atoms and the alkyl moiety has 1 to 6 carbon atoms, cycloalkyl having 3 to 10 carbon atoms, fused cycloalkylaryl having 8 to 12 carbon atoms heterocylic, or an amino-substituted alkyl group having 1 to 6 carbon atoms;

A, B and E are independently hydrogen, halogen, —OH, —OR, —CF_3, —NR_1R_2, —C(O)Y_1, —SO_2R, —$SO_2NR_1R_2$ provided that at least two of A, B and E are not hydrogen;

X_1 is —$(CH_2)_a$—, —$(CH_2)_bS(CH_2)_c$—, —$(CH_2)_bN(R)(CH_2)_c$—, —$(CH_2)_bC(O)(CH_2)_c$—, —$(CH_2)_bCH(R_3)(CH_2)_c$—;



X_2 is —$(CH_2)_d$—, —$(CH_2)_eS(CH_2)_f$—, —$(CH_2)_bN(R)(CH_2)_c$—, —$(CH_2)_eC(O)(CH_2)_f$—, or —$(CH_2)_eCH(R_3)(CH_2)_f$—;

provided that a, b, c, d, e, f, g, and h are each zero or a positive integer up to 6, and are selected so that the ring formed by X_1, and X_2, and the two atoms to which they are attached contains 5 to 8 atoms; wherein the alkyl, cycloalkyl, aryl, and fused aryl-cycloalkyl groups may carry substituents selected from the group consisting of alkyl with 1 to 6 carbon atoms, alkoxy with 1 to 6 carbon atoms, —CF_3, —OH, —SH, halogen, —NO_2, and —COOR.

4,556,653

PYRIDO[1,5]BENZODIAZEPINONE DERIVATIVES AND PHARMACOLOGICAL ACTIVITIES THEREOF

Roberto Giani; Ettore Parini, and Giancarlo Tonon, all of Milan, Italy, assignors to Dompe' Farmaceutica S.p.A., Milan, Italy

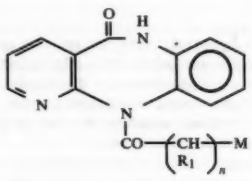
Filed May 9, 1984, Ser. No. 609,100

Claims priority, application Italy, May 17, 1983, 21134 A/83

Int. Cl.[4] **A61K** *31/55;* **C07D** *401/06, 403/06, 417/06*

U.S. Cl. 514—220 **12 Claims**

1. A compound of the formula:



in which:

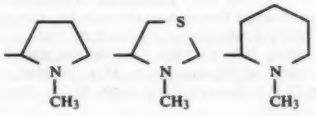
R_1 is H or CH_3

n is 0, 1 or 2

when:

n is 0

m represents a nitrogen cyclic group selected from:



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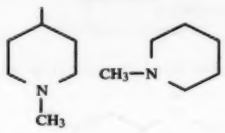
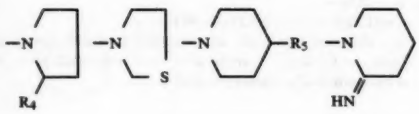
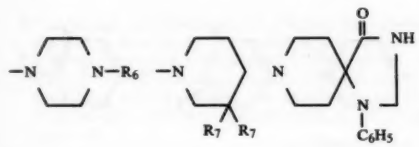
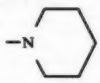


when:
n is 1 and R_1 is H
M represents a nitrogen cyclic group selected from:

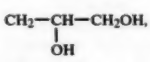




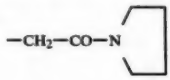
in which:
R_4 is H, CH_3 or C_2H_5
R_5 is —COOH, —$COOCH_3$, —$COOC_2H_5$ or



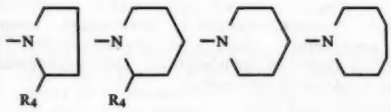
R_6 is acetyl, phenyl, cyclopropyl, CH_2—CH_2OH, CH_2—CH_2—CH_2OH,

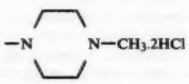


—$COOC_2H_5$ or

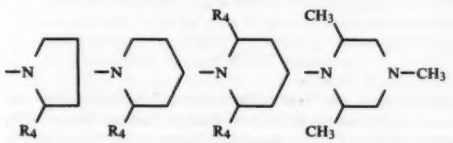


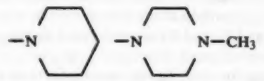
R_7 is H or CH_3
when:
n is 1 and R_1 is CH_3
M represents a nitrogen cyclic group selected from:





in which:
R_4 is H, CH_3 or C_2H_5
when:
n is 2 and R_1 is H
M represents a nitrogen cyclic group selected from:





in which:
R_4 is H, CH_3 or C_2H_5.

11. A pharmaceutical composition having antisecretory, antiulcer, antimuscarinic and spasmolytic activity which comprises as the principal active ingredient an effective amount of a compound according to claim **1**, or a pharmaceutically acceptable salt thereof, together with a pharmaceutically acceptable carrier.

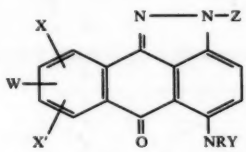
4,556,654

ANTIMICROBIAL SUBSTITUTED ANTHRA[1,9-CD]PYRAZOL-6(2H)-ONES

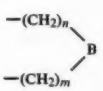
Howard D. H. Showalter, Ann Arbor; Judith L. Johnson, Ypsilanti; Leslie M. Werbel, and Edward F. Elslager, both of Ann Arbor, all of Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Jun. 28, 1983, Ser. No. 507,961
Int. Cl.[4] **A61K** *31/415, 31/445;* **C07D** *401/12, 231/54*
U.S. Cl. 514—222 **26 Claims**

1. A compound having the structural formula



wherein X, X', and W may be the same or different and are H, OH, alkoxy of one to four carbon atoms or chlorine; R is H or alkyl of from one to six carbon atoms; Y is H, alkyl of from one to six carbon atoms which may be substituted with an OR_1 group wherein R_1 is H or alkyl of from one to six carbon atoms, or ANR_2R_3 wherein A is straight or branched alkylene of from two to eight carbon atoms, R_2 and R_3 may be the same or different and are H, alkyl of from one to six carbon atoms which may be substituted with OH or an NRaRa wherein Ra may be the same or different and is H or alkyl of from one to three carbon atoms which may be substituted with OH, or NR_bR_b wherein R_b is the same or different and is H or alkyl of from one to three carbon atoms, or R_2 and R_3 when taken together may form



wherein n and m may be the same or different and are one,

two, or three provided that the sum of n and m is such as to form a five or six-membered ring and B is a direct bond, O, S, or N-R_4 wherein R_4 is H or alkyl of from one to six carbon atoms; R and Y when taken together may form

wherein n, m, and B are defined above; Z is alkyl of from one to six carbon atoms substituted with an $N(R_1)_2$, SR_1, or OR_1 group wherein R_1 is the same or different and is defined above, or DNR_2R_3 wherein D is straight or branched alkylene of from two to eight carbon atoms which may be substituted with an OH group and R_2 and R_3 are as defined above; or a pharmaceutically acceptable salt thereof.

26. A method for treating microbial infections in a mammal which comprises administering an antibacterially effective amount of a compound defined in claim **1** or a pharmaceutically acceptable salts thereof in combination with a pharmaceutically acceptable carrier, to a mammal in need thereof.

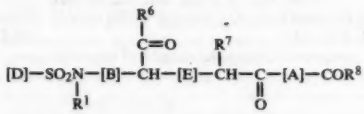
4,556,655

ANTIHYPERTENSIVE COMPOUNDS HAVING BOTH DIURETIC AND ANGIOTENSIN CONVERTING ENZYME INHIBITORY ACTIVITY

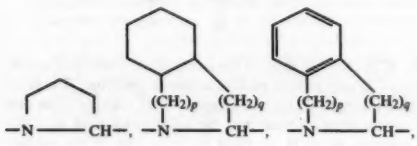
David R. Andrews, Bloomfield, and Federico C. A. Gaeta, Rockaway Township, Morris County, both of N.J., assignors to Schering Corporation, Kenilworth, N.J.

Filed Sep. 24, 1984, Ser. No. 653,186
Int. Cl.[4] C07D *417/12*; A61K *31/54*
U.S. Cl. 514—222 **22 Claims**

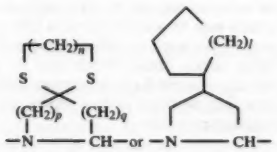
1. A compound represented by the formula



and the pharmaceutically acceptable salts thereof, wherein: A is

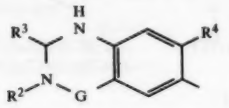


IIa IIb IIc



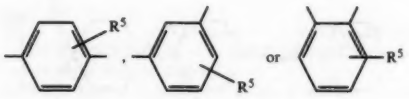
IId IIe

l is 1 or 2;
n is 0 or 1;
p and q are 0, 1 or 2, provided that in structures IIb and IIc the sum of p and q is 1 or 2, and that in formula IId, p is not 0;
B is —[J]—[L]—[M]—;
D is

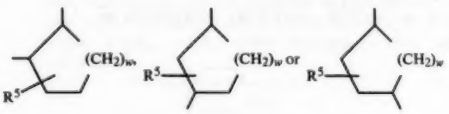


IIIa

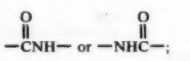
E is —NH—,—O—, —S—, or —CH_2—;
G is —SO_2—
J is —$(CH_2)_s$— or —$((CH_2)_t$—W)—;
L is a chemical bond, cis- or trans-lower alkene, lower alkyne, —Z—aryl, —aryl—Z—, —Z—cycloalkyl—, or —cycloalkyl-Z—, wherein aryl is



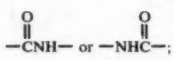
and cycloalkyl is



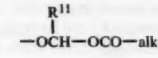
wherein
w is 1, 2 or 3;
M is —$(CH_2)_u$— or —$((CH_2)_r$—X—$(CH_2)_v)$—;
W is



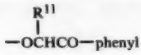
X and Z are independently a chemical bond, -NR^9-, -O-, -S-,



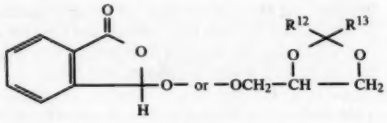
s, u and v are independently 0–5;
t is 1–5;
R^1, R^2 are independently hydrogen, lower alkyl or lower acyl;
R^3 is hydrogen, lower alkyl, halololoweralkyl, phenylloweralkyl, (cycloalkyl)loweralkyl, aminomethyl, loweralkylaminomethyl, phenyl(lower)alkylaminomethyl, (cycloalkyl)loweralkylaminomethyl, loweralkylthiomethyl or halololoweralkylthiomethyl;
R^4 is chlorine or CF_3;
R^5 is hydrogen, halogen, lower alkyl, lower acyl, lower alkoxy, halololoweralkyl or phenylloweralkyl;
R^7 is hydrogen, lower alkyl or aminoloweralkyl;
R^6 and R^8 are independently hydroxy, alkoxy having from 1 to 8 carbon atoms, benzyl, allyl, R^{10}-Qr-$(CH_2)_m$-O-, wherein Q is oxygen or sulfur, r is O or 1 and m is 2 to 4,



wherein the alkyl has from 3 to 8 carbon atoms,



wherein the phenyl may be substituted with group T defined below, 1-glyceryl,



R^{10} is phenyl, substituted phenyl wherein the substituents are chosen from group T, 1-naphthyl or 2-naphthyl;

T is halogen, hydroxy, trifluoromethyl, lower alkoxy, lower alkyl, 2-furanyl, 3-furanyl, 2-thienyl, 3-thienyl, phenyl and substituted phenyl wherein the substituents are chosen from halogen, hydroxy, trifluoromethyl, lower alkoxy or lower alkyl;

R^{11} is hydrogen or alkyl having from 1 to 8 carbon atoms;

R^{12} is hydrogen, lower alkyl, unsubstituted or substituted phenyl and substituted or unsubstituted phenyl lower alkyl, wherein phenyl may be substituted by group T;

R^{13} is hydrogen or lower alkyl;

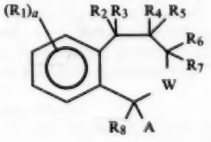
provided that if L is alkene or alkyne, J is $-(CH_2)_s-$ wherein s is 1-5; provided that if L is —Z-aryl—or —Z-cycloalkyl—, J is $-(CH_2)_s-$ wherein s is 2–5; provided that if L is alkene, alkyne, —aryl-Z— or —cycloalkyl-Z—, M is $-(CH_2)_u-$ wherein u is 1–5; provided that if s and u are each zero, L is aryl or cycloalkyl (i.e. Z is a bond); and provided that if s and v are each zero, L is aryl or cycloalkyl (ie. Z is a bond).

4,556,656
2-BENZOXEPINS

John M. McCall, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 953,574, Oct. 23, 1978, abandoned, which is a division of Ser. No. 847,350, Oct. 31, 1977, abandoned. This application Apr. 4, 1979, Ser. No. 26,718
Int. Cl.[4] **A61K** *31/335, 31/445, 31/495;* **C07D** *313/08, 295/02*
U.S. Cl. 514—227 **122 Claims**

1. Compounds having the formula



Ia

wherein

R_1 is the same or different and is selected from the group consisting of alkyl of one through three carbons, inclusive, alkoxy of one through three carbons, inclusive, trihaloalkyl of one or two carbons, hydroxy, halo, trihaloalkoxy of one or two carbons and o-methylenedioxy with the proviso that at least one R_1 is hydroxy, alkoxy or o-methylenedioxy;

a is one through three;

R_2 through R_7 are the same or different and are selected from the group consisting of hydrogen, alkyl of one through three carbons, inclusive, hydroxy, alkoxy of one through three carbons; phenyl; halo; cycloalkyl of three through six carbons when R_2 and R_3, R_4 and R_5, or R_6 and R_7 are taken together with the carbon to which they are attached; cycloalkyl of four through seven carbons when R_2 and R_4 or R_4 and R_6 are taken together with the carbons to which they are attached; and cycloalkyl of five or six carbons, with the over all provisos that no more than one ring may be attached to any one carbon and that at least two of R_2 through R_7 are hydrogen

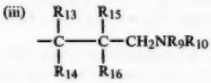
R_8 is alkyl of one through three carbons, hydrogen, or phenyl unsubstituted or substituted with a maximum of three substituents selected from the group consisting of alkyl of one through three carbons, halo, alkoxy of one through three carbons, and trihaloalkyl of one to two carbons;

W is oxygen; and A is selected from the group consisting of:

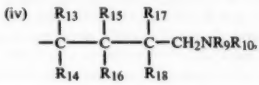
(i) $-(CH_2)_nNR_{21}R_{22}$, wherein n is one to five and $NR_{21}R_{22}$ is selected from the group consisting of $NR'_{21}R'_{22}$ wherein R'_{21} and R'_{22} can be the same or different and are selected from the group consisting of H, alkyl of one through four carbons, and together with N to which they are attached form heterocyclic rings of four to six ring atoms; morpholino and NR_9R_{10};

(ii) $-(CH_2)_m-(OCH_2CH_2)_q-NR_{21}R_{22}$, wherein m and q are each one to three, and $NR_{21}R_{22}$ is selected from the group consisting of NR''_{21}, R''_{22} wherein R''_{21} and R''_{22} can be the same or different and are selected from the group consisting of H, alkyl of one through four carbons, and together with the N to which they are attached form heterocyclic rings of four to six ring atoms; morpholino; $NHCH_2CH_2OH$ and NR_9R_{10};

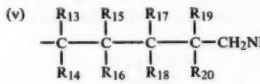
(iii)



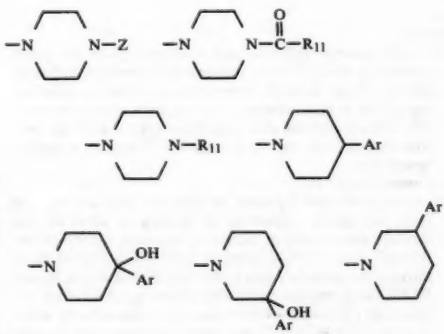
(iv)



(v)



wherein NR_9R_{10} is an amine selected from the group consisting of:



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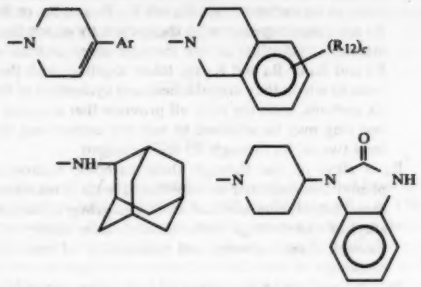


and

—$NHCH_2CH_2Ar'$

wherein R_{11} is alkyl of one through four carbons, 2-furyl, Ar, alkoxy of one to three carbon atoms, inclusive,

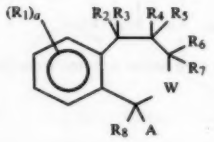
Z is selected from the group consisting of pyridyl, pyrimidinyl, triazinyl, pyrazinyl, pyridazinyl, pyrrolyl, imidazolyl, pyrazolyl, furyl, tetrazyl, oxazolyl, quinoxalinyl, and quinazolinyl, wherein each member of the group can be unsubstituted or substituted with one or two substituents selected from the group consisting of alkyl of one through three carbons, inclusive, alkoxy of one through three carbons, inclusive, hydroxy, halo, and haloalkyl of one through three carbons, inclusive; provided that Z is not 2-furyl;

R_{12} is alkyl or alkoxy of one through three carbons, hydroxy, halo, or trihalomethyl, R_{13} through R_{20} may be the same or different and are selected from the group hydrogen and alkyl of from 1 to 2 carbon atoms, inclusive; at least one of R_{13} through R_{20} when present being alkyl;

c is zero through two;

Ar and Ar' are phenyl unsubstituted or substituted with one through three substituents selected from the group consisting of alkyl or alkoxy of one through three carbons, hydroxy, halo, and trihaloalkyl or trihaloalkoxy of one or two carbons and pharmaceutically acceptable acid addition salts thereof.

89. A pharmaceutical composition comprising a dosage unit form having 0.5 to 300 mg of a compound selected from the group consisting of compounds having the formula:



Ia

wherein

R_1 is the same or different and is selected from the group consisting of alkyl of one through three carbons, inclusive, alkoxy of one through three carbons, inclusive, trihaloalkyl of one or two carbons, hydroxy, halo, trihaloalkoxy of one or two carbons and o-methylenedioxy with the proviso that at least one R_1 is hydroxy, alkoxy or o-methylenedioxy;

a is one through three;

R_2 through R_7 are the same or different and are selected from the group consisting of hydrogen, alkyl of one through three carbons, inclusive, hydroxy, alkoxy of one through three carbons; phenyl; halo; cycloalkyl of three through six carbons when R_2 and R_3, R_4 and R_5, or R_6 and R_7 are taken together with the carbon to which they are attached; cycloalkyl of four through seven carbons when R_2 and R_4 or R_4 and R_6 are taken together with the carbons to which they are attached; and cycloalkyl of five or six carbons, with the overall provisos that no more than one ring may be attached to any one carbon and that at least two of R_2 through R_7 are hydrogen.

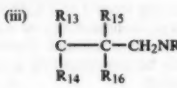
R_8 is alkyl of one through three carbons, hydrogen, or phenyl unsubstituted or substituted with a maximum of three substituents selected from the group consisting of alkyl of one through three carbons, halo, alkoxy of one through three carbons, and trihaloalkyl of one to two carbons;

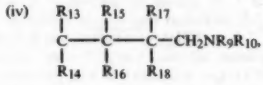
W is oxygen;

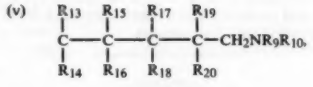
and A is selected from the group consisting of:

(i) $—(CH_2)_nNR_{21}R_{22}$, wherein n is one to five and $NR_{21}R_{22}$ is selected from the group consisting of $NR'_{21}R'_{22}$ wherein R'_{21} and R'_{22} can be the same or different and are selected from the group consisting of H, alkyl of one through four carbons, and together with N to which they are attached from heterocyclic rings of four to six ring atoms; morpholino and NR_9R_{10};

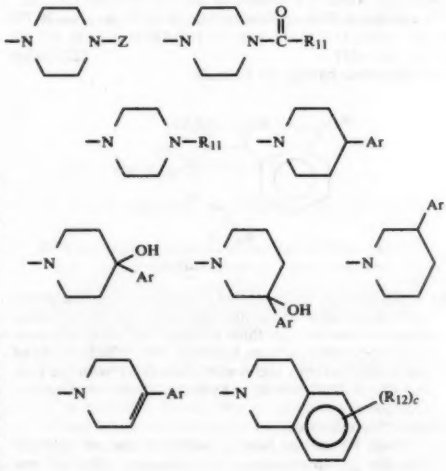
(ii) $—(CH_2)_m—(OCH_2CH_2)_q—NR_{21}R_{22}$, wherein m and q are each one to three, and $NR_{21}R_{22}$ is selected from the group consisting of $NR''_{21}R''_{22}$ wherein R''_{21} and R''_{22} can be the same or different and are selected from the group consisting of H, alkyl of one through four carbons, and together with the N to which they are attached form heterocyclic rings of four to six ring atoms; morpholino; $NHCH_2CH_2OH$ and NR_9R_{10};

(iii) 

(iv) 

(v) 

wherein NR_9R_{10} is an amine selected from the group consisting of:



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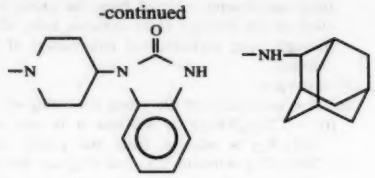


and

—$NHCH_2CH_2Ar'$

wherein R_{11} is alkyl of one through four carbons, 2-furyl, Ar, alkoxy of one to three carbon atoms, inclusive,

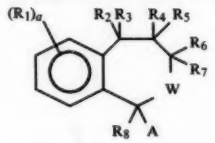
Z is selected from the group consisting of pyridyl, pyrimidinyl, triazinyl, pyrazinyl, pyridazinyl, pyrrolyl, imidazolyl, pyrazolyl, furyl, tetrazyl, oxazolyl, quinoxalinyl, and quinazolinyl, wherein each member of the group can be unsubstituted or substituted with one or two substituents selected from the group consisting of alkyl of one through three carbons, inclusive, alkoxy of one through three carbons, inclusive, hydroxy, halo, and haloalkyl of one through three carbons, inclusive; provided that Z is not 2-furyl;

R_{12} is alkyl or alkoxy of one through three carbons, hydroxy, halo, or trihalomethyl, R_{13} through R_{20} may be the same or different and are selected from the group hydrogen and alkyl of from 1 to 2 carbon atoms, inclusive; at least one of R_{13} through R_{20} when present being alkyl;

c is zero through two;

Ar and Ar' are phenyl unsubstituted or substituted with one through three substituents selected from the group consisting of alkyl or alkoxy of one through three carbons, hydroxy, halo, and trihaloalkyl or trihaloalkoxy of one or two carbons and pharmaceutically acceptable acid addition salts thereof.

105. A method of treating hypertension in mammals which comprises administering systemically to mammals an effective dose of compounds wherein the compound administered is selected from the group consisting of compounds having the formula:



Ia

wherein

R_1 is the same or different and is selected from the group consisting of alkyl of one through three carbons, inclusive, alkoxy of one through three carbons, inclusive, trihaloalkyl of one or two carbons, hydroxy, halo, trihaloalkoxy of one or two carbons and o-methylenedioxy with the proviso that at least one R_1 is hydroxy, alkoxy or o-methylenedioxy;

a is one through three;

R_2 through R_7 are the same or different and are selected from the group consisting of hydrogen, alkyl of one through three carbons, inclusive, hydroxy, alkoxy of one through three carbons; phenyl; halo; cycloalkyl of three through six carbons when R_2 and R_3, R_4 and R_5, or R_6 and R_7 are taken together with the carbon to which they are attached; cycloalkyl of four through seven carbons when R_2 and R_4 or R_4 and R_6 are taken together with the carbons to which they are attached; and cycloalkyl of five or six carbons, with the overall provisos that no more than one ring may be attached to any one carbon and that at least two of R_2 through R_7 are hydrogen,

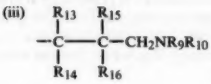
R_8 is alkyl of one through three carbons, hydrogen, or phenyl unsubstituted or substituted with a maximum of three substituents selected from the group consisting of alkyl of one through three carbons, halo, alkoxy of one through three carbons, and trihaloalkyl of one to two carbons;

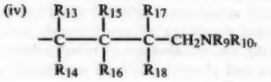
W is oxygen;

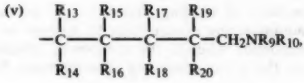
and A is selected from the group consisting of:

(i) $—(CH_2)_nNR_{21}R_{22}$, wherein n is one to five and $NR_{21}R_{22}$ is selected from the group consisting of $NR'_{21}R'_{22}$ wherein R'_{21} and R'_{22} can be the same or different and are selected from the group consisting of H, alkyl of one through four carbons, and together with N to which they are attached form heterocyclic rings of four to six ring atoms; morpholino and NR_9R_{10};

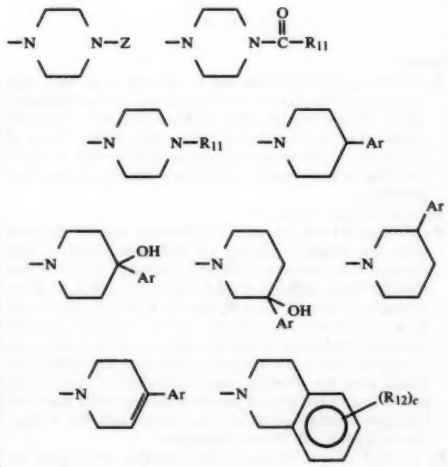
(ii) $—(CH_2)_m—(OCH_2CH_2)_q—NR_{21}R_{22}$, wherein m and q are each one to three, and $NR_{21}R_{22}$ is selected from the group consisting of $NR''_{21}R''_{22}$ wherein R''_{21} and R''_{22} can be the same or different and are selected from the group consisting of H, alkyl of one through four carbons, and together with the N to which they are attached form heterocyclic rings of four to six ring atoms; morpholino; $NHCH_2CH_2OH$ and NR_9R_{10};

(iii) 

(iv) 

(v) 

wherein NR_9R_{10} is an amine selected from the group consisting of:



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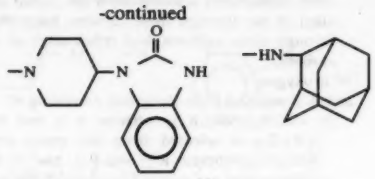


and

—$NHCH_2CH_2Ar'$

wherein R_{11} is alkyl of one through four carbons, 2-furyl, Ar, alkoxy of one to three carbon atoms, inclusive,

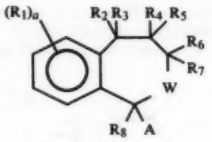
Z is selected from the group consisting of pyridyl, pyrimidinyl, triazinyl, pyrazinyl, pyridazinyl, pyrrolyl, imidazolyl, pyrazolyl, furyl, tetrazyl, oxazolyl, quinoxalinyl, and quinazolinyl, wherein each member of the group can be unsubstituted or substituted with one or two substituents selected from the group consisting of alkyl of one through three carbons, inclusive, alkoxy of one through three carbons, inclusive, hydroxy, halo, and haloalkyl of one through three carbons, inclusive; provided that Z is not 2-furyl;

R_{12} is alkyl or alkoxy of one through three carbons, hydroxy, halo, or trihalomethyl, R_{13} through R_{20} may be the same or different and are selected from the group hydrogen and alkyl of from 1 to 2 carbon atoms, inclusive; at least one of R_{13} through R_{20} when present being alkyl;

c is zero through two;

Ar and Ar' are phenyl unsubstituted or substituted with one through three substituents selected from the group consisting of alkyl or alkoxy of one through three carbons, hydroxy, halo, and trihaloalkyl or trihaloalkoxy of one or two carbons and pharmaceutically acceptable acid addition salts thereof.

111. A method of treating depression in humans which comprises administering systemically to humans an effective dose of compounds wherein the compound administered is selected from the group consisting of compounds having the formula:



Ia

wherein

R_1 is the same or different and is selected from the group consisting of alkyl of one through three carbons, inclusive, alkoxy of one through three carbons, inclusive, trihaloalkyl of one or two carbons, hydroxy, halo, trihaloalkoxy of one or two carbons and o-methylenedioxy with the proviso that at least one R_1 is hydroxy, alkoxy or o-methylenedioxy;

a is one through three;

R_2 through R_7 are the same or different and are selected from the group consisting of hydrogen, alkyl of one through three carbons, inclusive, hydroxy, alkoxy of one through three carbons; phenyl; halo; cycloalkyl of three through six carbons when R_2 and R_3, R_4 and R_5, or R_6 and R_7 are taken together with the carbon to which they are attached; cycloalkyl of four through seven carbons when R_2 and R_4 and R_6 are taken together with the carbons to which they are attached; and cycloalkyl of five or six carbons, with the overall provisos that no more than one ring may be attached to any one carbon and that at least two of R_2 through R_7 are hydrogen.

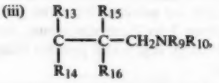
R_8 is alkyl of one through three carbons, hydrogen, or phenyl unsubstituted or substituted with a maximum of three substituents selected from the group consisting of alkyl of one through three carbons, halo, alkoxy of one through three carbons, and trihaloalkyl of one to two carbons;

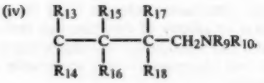
W is oxygen;

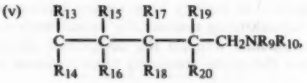
and A is selected from the group consisting of

(i) $—(CH_2)_nNR_{21}R_{22}$, wherein n is one to five and $NR_{21}R_{22}$ is selected from the group consisting of $NR'_{21}R'_{22}$ wherein R'_{21} and R'_{22} can be the same or different and are selected from the group consisting of H, alkyl of one through four carbons, and together with N to which they are attached form heterocyclic rings or four to six ring atoms; morpholino and NR_9R_{10};

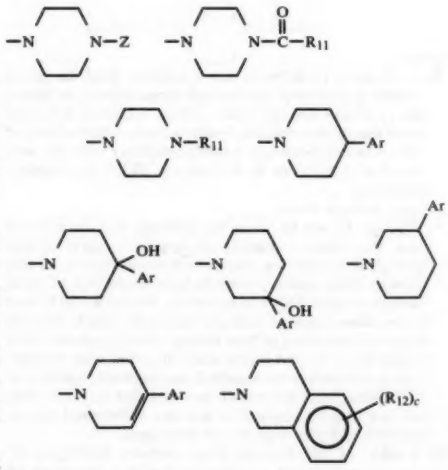
(ii) $—(CH_2)_m—(OCH_2CH_2)_q—NR_{21}R_{22}$, wherein m and q are each one to three, and $NR_{21}R_{22}$ is selected from the group consisting of $NR''_{21}R''_{22}$ wherein R''_{21} and R''_{22} can be the same or different and are selected from the group consisting of H, alkyl of one through four carbons, and together with the N to which they are attached form heterocyclic rings of four to six ring atoms; morpholino; $NHCH_2CH_2OH$ and NR_9R_{10};

(iii) 

(iv) 

(v) 

wherein NR_9R_{10} is an amine selected from the group consisting of:



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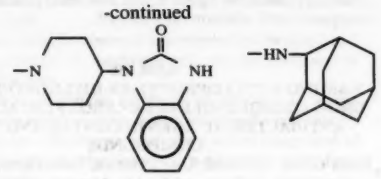


and

—$NHCH_2CH_2Ar'$

wherein R_{11} is alkyl of one through four carbons, 2-furyl,

Ar, alkoxy of one to three carbon atoms, inclusive,

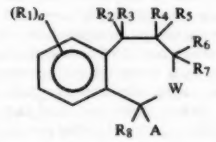
Z is selected from the group consisting of pyridyl, pyrimidinyl, triazinyl, pyrazinyl, pyridazinyl, pyrrolyl, imidazolyl, pyrazolyl, furyl, tetrazyl, oxazolyl, quinoxalinyl, and quinazolinyl, wherein each member of the group can be unsubstituted or substituted with one or two substituents selected from the group consisting of alkyl of one through three carbons, inclusive, alkoxy of one through three carbons, inclusive, hydroxy, halo, and haloalkyl of one through three carbons, inclusive; provided that Z is not 2-furyl

R_{12} is alkyl or alkoxy of one through three carbons, hydroxy, halo, or trihalomethyl, R_{13} through R_{20} may be the same or different and are selected from the group hydrogen and alkyl of from 1 to 2 carbon atoms, inclusive; at least one of R_{13} through R_{20} when present being alkyl;

c is zero through two;

Ar and Ar' are phenyl unsubstituted or substituted with one through three substituents selected from the group consisting of alkyl or alkoxy of one through three carbons, hydroxy, halo, and trihaloalkyl or trihaloalkoxy of one or two carbons and pharmaceutically acceptable acid addition salts thereof.

117. A method of analgesic treatment in mammals which comprises administering systemically to mammals an effective dose of compounds wherein the compound administered is selected from the group consisting of compounds having the formula:



Ia

wherein

R_1 is the same or different and is selected from the group consisting of alkyl of one through three carbons, inclusive, alkoxy of one through three carbons, inclusive, trihaloalkyl of one or two carbons, hydroxy, halo, trihaloalkoxy of one or two carbons and o-methylenedioxy with the proviso that at least one R_1 is hydroxy, alkoxy or o-methylenedioxy;

a is one through three;

R_2 through R_7 are the same or different and are selected from the group consisting of hydrogen, alkyl of one through three carbons, inclusive, hydroxy, alkoxy of one through three carbons; phenyl; halo; cycloalkyl of three through six carbons when R_2 and R_3, R_4 and R_5, or R_6 and R_7 are taken together with the carbon to which they are attached; cycloalkyl of four through seven carbons when R_2 and R_4 or R_4 and R_6 are taken together with the carbons to which they are attached; and cycloalkyl of five or six carbons, with the overall provisos that no more than one ring may be attached to any one carbon and that at least two of R_2 through R_7 are hydrogen.

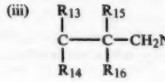
R_8 is alkyl of one through three carbons, hydrogen, or phenyl unsubstituted or substituted with a maximum of three substituents selected from the group consisting of alkyl of one through three carbons, halo, alkoxy of one through three carbons, and trihaloalkyl of one to two carbons;

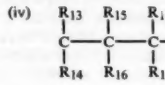
W is oxygen;

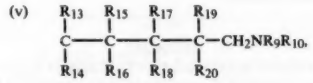
and A is selected from the group consisting of:

(i) —$(CH_2)_nNR_{21}R_{22}$, wherein n is one to five and $NR_{21}R_{22}$ is selected from the group consisting of $NR'_{21}R'_{22}$ wherein R'_{21} and R'_{22} can be the same or different and are selected from the group consisting of H, alkyl of one through four carbons, and together with N to which they are attached from heterocyclic rings of four to six ring atoms; morpholino and NR_9R_{10};

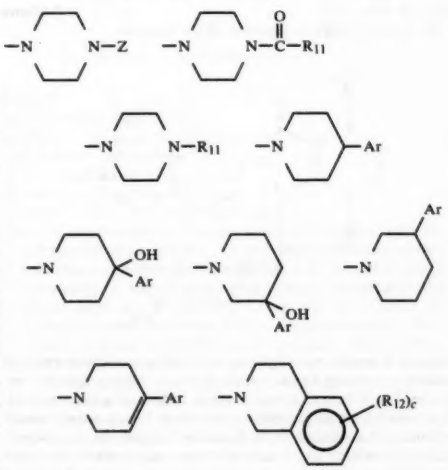
(ii) —$(CH_2)_m$—$(OCH_2CH_2)_q$—$NR_{21}R_{22}$, wherein m and q are each one to three, and $NR_{21}R_{22}$ is selected from the group consisting of $NR''_{21}R''_{22}$ wherein R''_{21} and R''_{22} can be the same or different and are selected from the group consisting of H, alkyl of one through four carbons, and together with the N to which they are attached form heterocyclic rings of four to six ring atoms; morpholino; $NHCH_2CH_2OH$ and NR_9R_{10};

(iii) 

(iv) 

(v) 

wherein NR_9R_{10} is an amine selected from the group consisting of:



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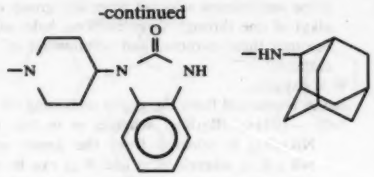


and

—$NHCH_2CH_2Ar'$

wherein R_{11} is alkyl of one through four carbons, 2-furyl, Ar, alkoxy of one to three carbon atoms, inclusive,

Z is selected from the group consisting of pyridyl, pyrimidinyl, triazinyl, pyrazinyl, pyridazinyl, pyrrolyl, imidazolyl, pyrazolyl, furyl, tetrazyl, oxazolyl, quinoxalinyl, and quinazolinyl, wherein each member of the group can be unsubstituted or substituted with one or two substituents selected from the group consisting of alkyl of one through three carbons, inclusive, alkoxy of one through three carbons, inclusive, hydroxy, halo, and haloalkyl of one through three carbons, inclusive; provided that Z is not 2-furyl;

R_{12} is alkyl or alkoxy of one through three carbons, hydroxy, halo, or trihalomethyl, R_{13} through R_{20} may be the same or different and are selected from the group hydrogen and alkyl of from 1 to 2 carbon atoms, inclusive; at least one of R_{13} through R_{20} when present being alkyl;

c is zero through two

Ar and Ar' are phenyl unsubstituted or substituted with one through three substituents selected from the group consisting of alkyl or alkoxy of one through three carbons, hydroxy, halo, and trihaloalkyl or trihaloalkoxy of one or two carbons and pharmaceutically acceptable acid addition salts thereof.

4,556,657

6-(1,8-NAPHTHYRIDIN-2-YL)-DITHIINO[1,4][2,3-C]-PYRROLES USEFUL AS TRANQUILLIZING AND ANTICONVULSANT AGENTS

Daniel Farge, Thiais; André Leger, Paris, and Gerard Ponsinet, Sucy-en-Brie, all of France, assignors to Rhone-Poulenc Sante, Courbevoie, France

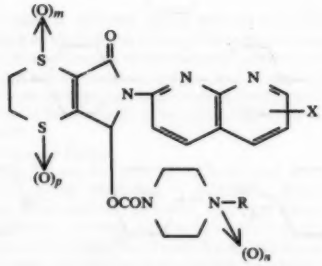
Filed Apr. 21, 1983, Ser. No. 487,132

Claims priority, application France, Apr. 22, 1982, 82 06943

Int. Cl.[4] C07D *401/14, 417/14;* A61K *31/495*

U.S. Cl. 514—252 **7 Claims**

1. A pure [1,4][2,3-c]pyrrole of the formula:



wherein X represents a hydrogen or halogen atom or an alkyl radical containing 1 to 4 carbon atoms, an alkoxy radical containing 1 to 4 carbon atoms, a cyano radical or a nitro radical, R represents an alkyl radical containing 1 to 4 carbon atoms optionally substituted by a hydroxy radical, or an alkenyl radical containing 2 to 4 carbon atoms, n represents 0 or 1, and one of the symbols m and p represents the figure 0 and the other represents the figure 1, and non-toxic pharmaceutically acceptable acid addition salts thereof.

4,556,658

7-AMINO-1-CYCLOPROPYL-6,8-DIFLUORO-1,4-DIHYDRO-4-OXO-QUINOLINE-3-CARBOXYLIC ACIDS AND ANTIBACTERIAL AGENTS CONTAINING THESE COMPOUNDS

Klaus Grohe, Odenthal; Uwe Petersen, Leverkusen; Hans-Joachim Zeiler, Velbert, and Karl G. Metzger, Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

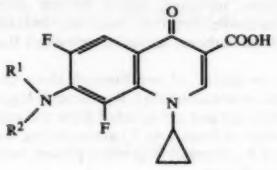
Filed Apr. 24, 1984, Ser. No. 603,480

Claims priority, application Fed. Rep. of Germany, May 18, 1983, 3318145

Int. Cl.[4] A61K *31/495;* C07D *401/04*

U.S. Cl. 514—254 **17 Claims**

1. A 7-amino-1-cyclopropyl-6,8-difluoro-1,4-dihydro-4-oxo-quinolinecarboxylic acid of the formula (I)



(I)

in which

R^1 and R^2 are identical or different and represent a C_1–C_4-alkyl radical which is optionally substituted by a hydroxyl, amino, methylamino or dimethylamino group, and R^1 and R^2, together with the nitrogen atom to which they are bonded, furthermore form a 5-membered or 6-membered heterocyclic ring, which can additionally have, as a ring member, the atoms or groups —O—, —S—, —SO—, $—SO_2—$ or $>N-R^3$ and which is optionally monosubstituted, disubstituted or trisubstituted at the carbon atoms by C_1–C_4-alkyl, hydroxyl, alkoxy having 1–3 carbon atoms, amino, methylamino or ethylamino, and each carbon atom carries no more than one substituent, and R^3 represents hydrogen, a branched or straight-chain alkyl, alkenyl or alkinyl group which has 1 to 6 carbon atoms and is optionally substituted by a hydroxyl, trifluoromethylmercapto, alkoxy, alkylmercapto, alkylamino or dialkylamino group having 1 to 3 carbon atoms per alkyl radical, the cyano group or the alkoxycarbonyl group having 1 to 4 carbon atoms in the alcohol part, or represents the benzyloxycarbonyl group, a phenylalkyl group which has up to 4 carbon atoms in the aliphatic part and is optionally substituted in the phenyl radical by nitro or amino, a phenyl radical which is optionally monosubstituted or disubstituted by hydroxyl, methoxy, chlorine or fluorine, a phenylacyl radical which is optionally monosubstituted or disubstituted by hydroxyl, methoxy, chlorine and fluorine, an oxoalkyl radical having up to 6 carbon atoms and a cycloalkyl-alkyl radical having up to 6 carbon atoms in the cyclic part and up to 3 carbon atoms in the acyclic part, and furthermore denotes a radical COR^4, CN or SO_2R^5,

wherein

R^4 represents hydrogen or straight-chain or branched alkyl which has 1 to 4 C atoms and is optionally substituted by 1 or 2 substituents selected from amino, alkoxycarbonyl having 1 to 3 carbon atoms in the alkyl part, carboxyl, alkoxy having 1 to 3 carbon atoms and trifluoromethylthio, or represents phenyl which is optionally substituted by chlorine, hydroxyl, amino or carboxyl, or represents alkoxy having 1 to 4 C atoms, alkylthio having 1 or 2 C atoms, benzyloxy or amino, or represents alkylamino which has 1 to 5 C atoms and is optionally substituted by

alkoxycarbonyl having 1 to 3 C atoms in the alkyl part or carboxyl, and

R^5 represents straight-chain or branched alkyl having 1 to 3 C atoms, phenyl or methylphenyl, and its pharmaceutically useful salts.

15. A method of combatting bacterial infection in warm-blooded animals which comprises administering to said animals an antibacterially effective amount of an active compound of claim 1 either alone, in admixture with a diluent or in the form of a medicament.

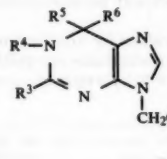
4,556,659

SUBSTITUTED 9-(1-0- OR 3-0-MONOSUBSTITUTED OR 1,3-DI-0-SUBSTITUTED PROPOXYMETHYL)-PURINES AS ANTIVIRAL AGENTS

Julien P. H. Verheyden, Los Altos, and John C. Martin, Redwood City, both of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed Aug. 9, 1982, Ser. No. 406,583
Int. Cl.[4] C07D *473/02*; A61K *31/52*
U.S. Cl. 514—262 **28 Claims**

1. A compound of the formula



(I)

wherein

R^1 is hydrogen, —C(Y) OR^7 or —C(O)NHR^7 wherein R^7 is alkyl of one to twelve carbon atoms, alkenyl of two to twelve carbon atoms, cyclopentyl, cyclohexyl, phenyl or benzyl;

R^2 is —C(Y)OR^7 or —C(O)NHR^7 wherein R^7 is as defined above;

Y is oxygen or sulfur;

R^3 is hydrogen, halo, thio, lower alkylthio of one to six carbon atoms, azido, NR^9R^{10} wherein R^9 and R^{10} are independently hydrogen or lower alkyl of one to six carbon atoms or —NHC(O)R^8 wherein R^8 is hydrogen, alkyl of one to nineteen carbon atoms or 1-adamantyl; and

(a) R^6 is hydrogen, halo, lower alkoxy of one to six carbon atoms, azido, thio, lower alkylthio of one to six carbon atoms, —NR^9R^{10} wherein R^9 and R^{10} are as defined above or -NHC(O)R^8 wherein R^8 is as defined above and R^4 together with R^5 is a bond; or

(b) R^5 together with R^6 is a keto group and R^4 is hydrogen.

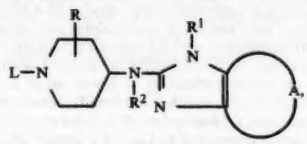
4,556,660

N-(BICYCLIC HETEROCYCLYL)-4-PIPERIDINAMINES

Frans E. Janssens, Bonbeiden; Joseph L. G. Torremans, Beerse; Jozef F. Hens, Nijlen, and Theophilus T. J. M. Van Offenwert, Vosselaar, all of Belgium, assignors to Janssen Pharmaceutica N.V., Beerse, Belgium

Continuation-in-part of Ser. No. 397,626, Jul. 12, 1982, abandoned. This application Apr. 22, 1983, Ser. No. 487,774
Int. Cl.[4] C07D *401/12*; A61K *31/445*
U.S. Cl. 514—272 **15 Claims**

1. A chemical compound having the formula



(I)

a pharmaceutically acceptable acid addition salt or a stereochemically isomeric form thereof, wherein:

A is a bivalent radical having the formula

—CH=CH—CH=CH— (a),

—N=CH—CH=CH— (b),

—CH=N—CH=CH— (c),

—CH=CH—N=CH— (d), or

—CH=CH—CH=N— (e),

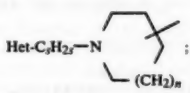
wherein one or two hydrogen atoms in said radicals (a)–(e) may, each independently from each other, be replaced by halo, lower alkyl, lower alkyloxy, trifluoromethyl or hydroxy;

R is a member selected from the group consisting of hydrogen and lower alkyl;

R^1 is a member selected from the group consisting of hydrogen, C_1–C_{10} alkyl, C_3–C_6 cycloalkyl, Ar^1 and lower alkyl substituted with one or two Ar^1 radicals;

R^2 is a member selected from the group consisting of hydrogen, lower alkyl, C_3–C_6cycloalkyl, (lower alkyl)—CO— and Ar^2-lower alkyl;

L is a member selected from the group consisting of a radical of formula

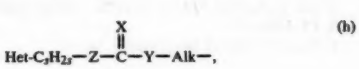


(f)

a radical of formula

Het—C_sH_{2s}—Y—Alk— (g); and

a radical of formula



(h)

wherein

n is 0 or the integer 1 or 2;

s is 0 or an integer of from 1 to 6 inclusive;

Alk is lower alkanediyl;

Y is O, S, NR^3 or a direct bond;

X is O, S, CH—NO_2 or NR^4;

Z is O, S, NR^5 or a direct bond; and

Het is a member selected fro the group consisting of a pyridinyl radical which is optionally substituted with one or two substituents each independently selected from the group consisting of halo, amino, nitro, cyano, aminocarbonyl, lower alkyl, lower alkyloxy, lower alkylthio, lower alkyloxycarbonyl, hydroxy, lower alkylcarbonyloxy, Ar^2-lower alkyl and carboxyl; a pyridinyloxide radical optionally substituted with nitro; a quinolinyl radical which is optionally substituted with a lower alkyl radical; a pyrimidinyl radical which is optionally substituted with one or two substituents each independently selected from the group consisting of halo, amino, hydroxy, lower alkyl, lower alkyloxy, lower alkylthio and (Ar^2)-lower alkyl; a quinazolinyl radical which is optionally substituted with a

hydroxy radical or a lower alkyl radical; a pyridazinyl radical which is optionally substituted with a lower alkyl radical or a halo radical; a quinoxalinyl radical which is optionally substituted with a lower alkyl radical; a pyrazinyl radical which is optionally substituted with a halo radical, an amino radical or a lower alkyl radical; a phthalazinyl radical which is optionally substituted by a halo radical; and a 5,6-dihydro-4H-1,3-thiazin-2-yl radical, said Het being connected to $C_{\pm 2}$ on a carbon atom;

said R^3 being hydrogen, lower alkyl, (Ar^2)lower alkyl, 2-lower alkyloxy-1,2-dioxoethyl or a radical of formula —C(=X)—R^6, R^6 being hydrogen, lower alkyl, Ar^2, Ar^2-lower alkyl, lower alkyloxy, Ar^2-lower alkyloxy, mono- or di(lower alkyl)amino, Ar^2-lower alkylamino or Ar^2-lower alkyl(lower alkyl)amino;

said R^4 being hydrogen, lower alkyl, cyano, nitro, Ar^2-sulfonyl, lower alkylsulfonyl, lower alkylcarbonyl or Ar^2-carbonyl; and

said R^5 being hydrogen or lower alkyl;

provided that Het is other than pyridinyl or mono- or di(-lower alkyloxy)pyridinyl where L is a radical (g) wherein Y is NR^3 or where L is a radical (h) wherein X is O and Z is NR^5 or a direct bond;

wherein Ar^1 is a member selected from the group consisting of phenyl, being optionally substituted with up to three substituents each independently selected from the group consisting of halo, hydroxy, nitro, cyano, trifluoromethyl, lower alkyl, lower alkyloxy, lower alkylthio, mercapto, amino, mono- and di(lower alkyl)amino, carboxyl, lower alkyloxycarbonyl and (lower alkyl)—CO—; thienyl; halothienyl; furanyl; lower alkyl substituted furanyl; pyridinyl; pyrazinyl; thiazolyl and imidazolyl optionally substituted by lower alkyl; and wherein Ar^2 is a member selected from the group consisting of phenyl being optionally substituted with up to three substituents each independently selected from the group consisting of halo, hydroxy, nitro, cyano, trifluoromethyl, lower alkyl, lower alkyloxy, lower alkylthio, mercapto, amino, mono- and di(lower alkyl-)amino, carboxyl, lower alkyloxycarbonyl and (lower alkyl-)—CO.

4,556,661

PYRIDINE DERIVATIVES

Franz Dorn, Dielsdorf; François Montavon, Delémont, and Milos Suchy, Pfaffhausen, all of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

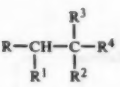
Filed Aug. 27, 1982, Ser. No. 412,360

Claims priority, application Switzerland, Sep. 1, 1981, 5622/81; Jul. 9, 1982, 4206/82

Int. Cl.⁴ C07D *213/30, 213/26, 213/89;* **A01N** *43/40*

U.S. Cl. 514—277 **14 Claims**

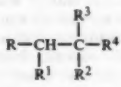
1. A compound of the formula



I

wherein R is 2,4-dichlorophenyl R^1 is halogen, C_{1-4}-alkyl, OR^5, SR^5 or OSO_2R^5, R^2 is hydroxy or chlorine, R^3 is C_{1-4}-alkyl, R^4 is 3-pyridyl or 3-pyridyl-1-oxide, and R^5 is C_{1-4}-alkyl, with the proviso that when R^2 is chlorine and R^3 is C_{1-4}-alkyl, R^1 is not bromine or iodine, and an acid addition salt thereof.

8. A fungicidal composition comprising a compatible carrier material and, as the active ingredient, an amount which is effective as a fungicide of a compound of the formula



I

wherein R is 2,4-dichlorophenyl R^1 is halogen, C_{1-4}-alkyl, OR^5, SR^6 or OSO_2R^5, R^2 is hydroxy or chlorine, R^3 is C_{1-4}-alkyl, R^4 is 3-pyridyl, 3-pyridyl-1-oxide, and R^5 is C_{1-4}-alkyl, with the proviso that when R^2 is chlorine and R^3 is C_{1-4}-alkyl, R^1 is not bromine or iodine, or an acid addition salt thereof.

4,556,662

BISPIDINE DERIVATIVES AND ANTIARRHYTHMIC COMPOSITIONS

Fritz Binnig, Fussgoenheim; Claus D. Mueller, Viernheim; Manfred Raschack, Weisenheim am Sand, and Gerda von Philipsborn, Weinheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

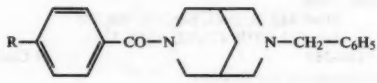
Division of Ser. No. 354,515, Mar. 3, 1982, Pat. No. 4,459,301. This application Sep. 30, 1983, Ser. No. 537,838

Claims priority, application Fed. Rep. of Germany, Mar. 27, 1981, 3112055

Int. Cl.⁴ A61K *31/435;* **C07D** *471/08*

U.S. Cl. 514—300 **4 Claims**

1. A bispidine derivative of the formula I



I

where R is amino, and its salts with physiologically tolerated acids.

3. A pharmaceutical composition for treating cardiac disorders which comprises a pharmaceutically acceptable solid or liquid carrier and from 0.1 to 99% by weight of a compound of the formula I of claim 1.

4,556,663

BENZOYLECGONINE, BENZOYLNORECGONINE AND ECGONINE AS ACTIVE AGENTS FOR THE TREATMENT OF RHEUMATOID ARTHRITIS AND OSTEOARTHRITIS

Lowell M. Somers, 46861 Madison, Indio, Calif. 92201

Continuation-in-part of Ser. No. 448,928, Dec. 13, 1982, Pat. No. 4,469,700, which is a continuation of Ser. No. 275,307, Jun. 19, 1981, abandoned. This application Aug. 31, 1984, Ser. No. 646,586

Int. Cl.⁴ A01K *31/44*

U.S. Cl. 514—304 **15 Claims**

1. A pharmaceutical formulation for the treatment of rheumatoid arthritis comprising ecgonine in amounts effective for the treatment of rheumatoid arthritis in human patients afflicted with the disease and a pharmaceutical carrier for said ecgonine said formulation being adapted for administration to patients through inhalation or through mucosal membranes of the patient's body, the formulation being further adapted for administering daily dosages of approximately 1 to 8 miligrams of ecgonine per kilogram body weight of the patient.

4,556,664

METHOD AND COMPOSITION FOR THE TREATMENT OF CARDIAC ARRHYTHMIAS

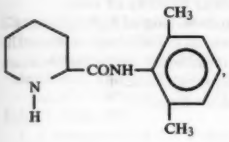
Gunnar A. K. Aberg, 519 Bergen St., Lawrenceville, N.J. 08648; Peter R. Maroko, Cherry Hill, N.J., and Bo T. af Ekenstam, Hjalteby, Sweden, assignors to Gunnar A. K. Aberg, Lawrenceville, N.J.

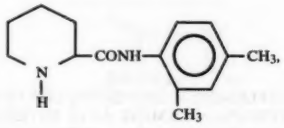
Filed Mar. 13, 1984, Ser. No. 588,955

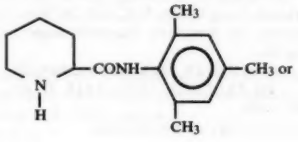
Int. Cl.⁴ A61K *31/445*

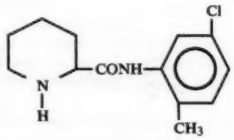
U.S. Cl. 514—330 **20 Claims**

1. A method for treating cardiac arrhythmias in mammals comprising administering to a mammal susceptible to cardiac arrhythmias an effective amount to inhibit cardiac arrhythmias of at least one compound selected from









an optically active isomer of such compounds, a pharmaceutically acceptable acid addition salt of such compounds, or mixtures thereof.

4,556,665

CARDIOTONIC 1,3-DIHYDRO-4-[[(IMIDAZOL-1-YL)ARYL]CARBONYL-]IMIDAZOL-2-ONES

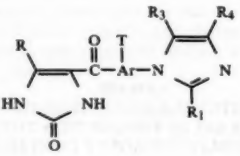
Paul W. Erhardt, Long Valley; Alfred A. Hagedorn, III, Edison, both of N.J.; William C. Lumma, Jr., Pennsburg, Pa., and Ronald A. Wohl, Morris Plains, N.J., assignors to Schering A.G., Berlin, Fed. Rep. of Germany

Filed Jul. 9, 1984, Ser. No. 628,875

Int. Cl.[4] A61K *31/415, 31/44;* **C07D** *233/70, 401/14*

U.S. Cl. 514—338 **19 Claims**

1. A compound of the formula:



wherein

R is hydrogen or lower alkyl;

Ar is phenyl or pyridyl;

T is hydrogen, hydroxy, halogen or lower alkyl;

R_1, R_3 and R_4 are hydrogen or lower alkyl optionally substituted by 0 to 2 hydroxyl groups, or R_3 and R_4 taken together form a benzene ring;

with the provisos that:

(a) when T is hydroxy, Ar is phenyl,

(b) when one of R_1, R_3 and R_4 is lower alkyl substituted with 2 hydroxyl groups both hydroxyls cannot be on the same carbon atom;

or a pharmaceutically acceptable salt thereof.

19. The method of treating cardiac failure in a mammalian host having a disease condition in which therapeutic benefit is derived from elicitation of a cardiotonic effect which comprises administering to said host a non-toxic cardiotonically effective amount of a compound of claim 1.

4,556,666

CYCLOPROPANE CARBOXYLIC ACID DERIVATIVES

Jean Tessier, Vincennes; Jean-Pierre Demoute, Montreuil-sous-Bois, and Joseph Cadiergue, Aulnay-sous-Bois, all of France, assignors to Roussel Uclaf, Paris, France

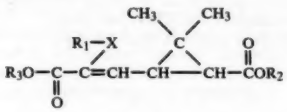
Filed Oct. 12, 1983, Ser. No. 541,084

Claims priority, application France, Oct. 12, 1982, 82 17055

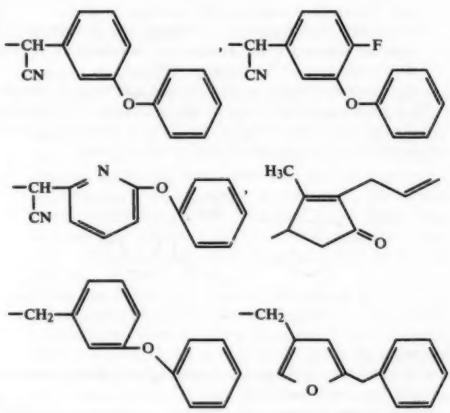
Int. Cl.[4] C07G *121/50*

U.S. Cl. 514—351 **10 Claims**

1. A compound selected from the group consisting of all stereoisomer forms and mixtures of stereoisomers of compounds of the formula



wherein X is selected from the group consisting of oxygen, sulfur, sulfoxide and sulfone, R_1 and R_3 are individually selected from the group consisting of alkyl of 1 to 7 carbon atoms, alkenyl and alkadienyl of 2 to 7 carbon atoms and cycloalkyl and cycloalkenyl of 3 to 7 carbon atoms optionally substituted with at least one halogen and optionally interrupted with at least one heteroatom and aryl and aralkyl of 6 to 18 carbon atoms and R_2 is selected from the group consisting of



4,556,667

ARYL SUBSTITUTED PYRIDO[1,4]BENZODIAZEPINES AND THEIR USE AS ANTIDEPRESSIVES

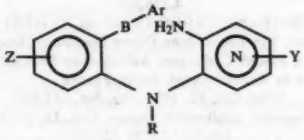
Chandler R. Taylor, Jr., Mechanicsville, Va., assignor to A. H. Robins Company, Incorporated, Richmond, Va.

Division of Ser. No. 395,218, Jul. 6, 1982, Pat. No. 4,447,361, and a continuation-in-part of Ser. No. 305,080, Sep. 24, 1981, abandoned. This application Dec. 9, 1983, Ser. No. 548,045

Int. Cl.[4] C07D *213/74, 409/02*

U.S. Cl. 514—352 **42 Claims**

1. A compound selected from the group having the formula:

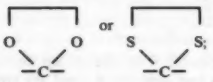


wherein;

R is selected from the group consisting of hydrogen, loweralkyl, —alk[1]—halo, —alk[1]—NR^1R^2 or —alk[1]—N=CH—OCH_2H_5;

R^1 and R^2 are selected from the group consisting of hydrogen, loweralkyl, or —C(O)O-loweralkyl;

B is selected from carbonyl, thioxomethyl,



Ar is selected from the group consisting of 2, 3 and 4 pyridinyl, 2 or 3 thienyl, phenyl or phenyl substituted by 1 to 3 radicals selected from halo, loweralkyl, loweralkoxy, trifluoromethyl or nitro and may be the same or different;

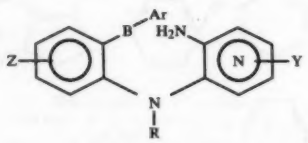
alk[1] is a straight or branched hydrocarbon chain containing 1–8 carbon atoms;

Z is selected from the group consisting of hydrogen, halogen, loweralkyl, loweralkoxy, hydroxy or nitro;

Y is selected from the group consisting of hydrogen or 1–2 radicals selected from loweralkyl, loweralkoxy or hydroxy and may be the same or different;

and a pharmaceutically acceptable acid addition salt thereof.

29. A pharmaceutical composition for treating depression in unit dosage form comprising (a) an effective amount for treating depression of a compound having the formula:



wherein;

R is selected from the group consisting of hydrogen, loweralkyl, or —alk[1]—NR^1r^2;

R^1 and R^2 are selected from the group consisting of hydrogen or loweralkyl;

alk[1] is a straight or branched hydrocarbon chain containing 1–8 carbon atoms;

B is selected from carbonyl or thioxomethyl;

Ar is selected from the group consisting of 2, 3 and 4-pyridinyl, 2-3-thienyl, phenyl or phenyl substituted by 1 to 3 radicals selected from halo, loweralkyl, loweralkoxy, trifluoromethyl or nitro and may be the same or different;

Z is selected from the group consisting of hydrogen, halogen, loweralkyl, loweralkoxy, hydroxy or nitro;

Y is selected from the group consisting of hydrogen or 1-2 radicals selected from loweralkyl, hydroxy or loweralkoxy and may be the same or different, and a pharmaceutically acceptable acid addition salt thereof;

and (b) a pharmaceutical carrier therefor.

4,556,668

ETHYLENEDIAMINE DERIVATIVES OF ARYLOXYPROPANOLAMINE ARYL ESTERS HAVING VARIOUS MEDICINAL PROPERTIES

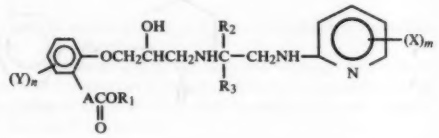
Paul W. Erhardt, Long Valley, N.J., and Chi Woo, Vernon Hills, Ill., assignors to American Hospital Supply Corporation, Evanston, Ill.

Filed Jul. 15, 1983, Ser. No. 514,120

Int. Cl.[4] C07D *213/74;* A61K *31/44*

U.S. Cl. 514—353 **10 Claims**

1. A compound having the formula



wherein R_1 is alkyl of from 1 to 5 carbon atoms, alkenyl of from 2 to 5 carbon atoms, cycloalkyl of from 3 to 7 carbon atoms; R_2 and R_3 are independently hydrogen or an alkyl of from 1 to 3 carbon atoms; X is alkyl of from 1 to 4 carbon atoms, alkenyl of from 2 to 4 carbon atoms, halogen, amino, nitro, hydroxy; m is an integer from 0 to 1, A is a direct bond, Y is alkyl of from 1 to 4 carbon atoms, alkenyl of from 2 to 4 carbon atoms, halogen, amino, nitro, hydroxy; n is an integer from 0 to 1; and the pharmaceutically acceptable salts thereof.

9. A pharmaceutical composition useful in the treatment of ischemic heart disease, myocardial infarction, arrhythmias or angina pectoris comprising an effective amount of a compound in accordance with claim **1** in admixture with a pharmaceutical carrier or diluent.

4,556,669

2,-3-DI-SUBSTITUTED-5,6-DIHYDROIMIDAZO [2,1-B] THIAZOLE, ITS SALTS, PRODUCTION THEREOF AND ANTI-INFLAMMATORY AGENT CONTAINING THE SAME

Kazuo Nishio, Saitama; Isao Chiyomaru, Shizuoka; Katsuo Anma, Saitama; Kazuko Yamamoto, Shizuoka; Hiroshi Ohno, Shizuoka, and Noriyasu Takayanagi, Shizuoka, all of Japan, assignors to Kumiai Kagaku Kogyo Kabushiki Kaisha, Tokyo and Toyo Jozo Kabushiki Kaisha, Shizuoka, both of, Japan

Continuation of Ser. No. 367,600, Apr. 12, 1982, abandoned. This application Apr. 13, 1984, Ser. No. 600,011

Claims priority, application Japan, Apr. 10, 1981, 56-54166

Int. Cl.[4] C07D *513/04;* A61K *31/425*

U.S. Cl. 514—368 **2 Claims**

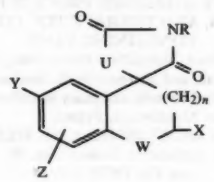
1. 2-(3,4-Dichlorophenylcarbamoyl)-3-methyl-5,6-dihydroimidazo [2,1-b] thiazole or a pharmaceutically acceptable salt thereof.

4,556,670
SPIRO-3-HETERO-AZOLONES FOR TREATMENT OF DIABETIC COMPLICATIONS

Christopher A. Lipinski, Waterford, Conn., assignor to Pfizer Inc., New York, N.Y.

Continuation-in-part of Ser. No. 447,337, Dec. 6, 1982, abandoned. This application Oct. 28, 1983, Ser. No. 545,450
Int. Cl.[4] C07D *277/34, 233/38, 263/44;* A61K *31/415*
U.S. Cl. 514—390 60 Claims

1. A compound of the formula



or a pharmaceutically acceptable salt thereof, wherein:
U is oxygen, sulfur or nitrogen substituted with hydrogen or alkyl having 1–4 carbon atoms;
n is zero or one;
W is carbonyl or hydroxymethylene;
R is hydrogen or alkyl having 1–4 carbon atoms;
X is hydrogen, chloro, bromo, iodo, alkyl having 1–4 carbon atoms, dimethy or $(CH_2)_mQ$ wherein m is 1 or 2 and Q is phenyl or halophenyl, with the proviso that when X is dimethyl, n is one;
Y is hydrogen, halo, nitro, trifluoromethyl, alkoxy having 1–4 carbon atoms or alkyl having 1–4 carbon atoms; and
Z is hydrogen, halo, nitro, trifluoromethyl, alkoxy having 1–4 carbon atoms or alkyl having 1–4 carbon atoms, with the proviso that if either Y or Z is nitro the other is hydrogen.

4,556,671
PHARMACEUTICAL FORMULATIONS

Frederick C. Copp, and Kenneth E. Eakins, both of Beckenham, England, assignors to Burroughs Wellcome Co., Research Triangle Park, N.C.

Division of Ser. No. 57,362, Jul. 13, 1979, abandoned. This application May 22, 1981, Ser. No. 266,477
Int. Cl.[4] A61K *31/415*
U.S. Cl. 514—404 1 Claim

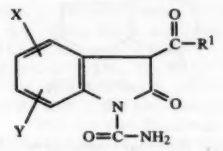
1. The method of inhibiting cyclo-oxygenase and lipoxygenase enzymes in a mammal in need thereof which comprises the topical administration to said mammal of inhibitory amount of 3-amino-1-(m-trifluoromethyl-phenyl)-2-pyrazol-2ine or a pharmaceutically acceptable acid addition salt thereof to inhibit said enzymes.

4,556,672
3-SUBSTITUTED 2-OXINDOLE-1-CARBOXAMIDES AS ANALGESIC AND ANTI-INFLAMMATORY AGENTS

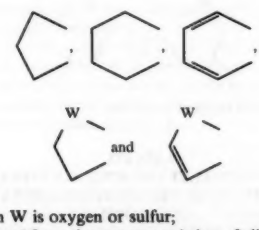
Saul B. Kadin, New London, Conn., assignor to Pfizer Inc., New York, N.Y.

Continuation-in-part of Ser. No. 590,659, Mar. 19, 1984, abandoned. This application Dec. 21, 1984, Ser. No. 684,634
Int. Cl.[4] A61K *31/40;* C07D *209/34*
U.S. Cl. 514—414 65 Claims

20. A method of eliciting an analgesic response in a mammalian subject, which comprises administering to said mammalian subject an analgesic response eliciting amount of a 2-oxindole-1-carboxamide compound of the formula

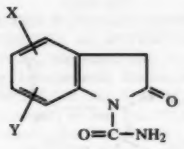


or a pharmaceutically-acceptable base salt thereof; wherein
X is selected from the group consisting of hydrogen, fluoro, chloro, bromo, alkyl having 1 to 4 carbons, cycloalkyl having 3 to 7 carbons, alkoxy having 1 to 4 carbons, alkylthio having 1 to 4 carbons, trifluoromethyl, alkylsulfinyl having 1 to 4 carbons, alkylsulfonyl having 1 to 4 carbons, nitro, phenyl, alkanoyl having 2 to 4 carbons, benzoyl, thenoyl, alkanamido having 2 to 4 carbons, benzamido and N,N-dialkylsulfamoyl having 1 to 3 carbons in each of said alkyls; and Y is selected from the group consisting of hydrogen, fluoro, chloro, bromo, alkyl having 1 to 4 carbons, cycloalkyl having 3 to 7 carbons, alkoxy having 1 to 4 carbons, alkylthio having 1 to 4 carbons and trifluoromethyl;
or X and Y when taken together are a 4,5-, 5,6- or 6,7-methylenedioxy group or a 4,5-, 5,6- or 6,7-ethylenedioxy group;
or X and Y when taken together and when attached to adjacent carbon atoms, form a divalent radical Z, wherein Z is selected from the group consisting of



wherein W is oxygen or sulfur;
R^1 is selected from the group consisting of alkyl having 1 to 6 carbons, cycloalkyl having 3 to 7 carbons, cycloalkenyl having 4 to 7 carbons, phenyl, substituted phenyl, phenylalkyl having 1 to 3 carbons in said alkyl, (substituted phenyl)alkyl having 1 to 3 carbons in said alkyl, phenoxyalkyl having 1 to 3 carbons in said alkyl, (substituted phenoxy)alkyl having 1 to 3 carbons in said alkyl, (thiophenoxy)alkyl having 1 to 3 carbons in said alkyl, naphthyl, bicyclo[2.2.1]heptan-2-yl, bicyclo[2.2.1]hept-5-en-2-yl and $—(CH_2)_n—Q—R^*$;
wherein the substituent on said substituted phenyl, said (substituted phenyl)alkyl and said (substituted phenoxy)alkyl is selected from the group consisting of fluoro, chloro, bromo, alkyl having 1 to 4 carbons, alkoxy having 1 to 4 carbons and trifluoromethyl; n is zero, 1 or 2; Q is a divalent radical derived from a compound selected from the group consisting of furan, thiophene, pyrrole, pyrazole, imidazole, thiazole, isothiazole, oxazole, isoxazole, 1,2,3-thiadiazole, 1,3,4-thiadiazole, 1,2,5-thiadiazole, tetrahydrofuran, tetrahydrothiophene, tetrahydropyran, tetrahydrothiopyran, pyridine, pyrimidine, pyrazine, benzo[b]furan and benzo[b]thiophene; and R^* is hydrogen or alkyl having 1 to 3 carbons.

59. A compound of the formula

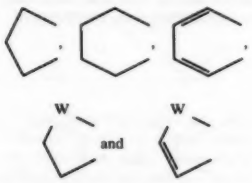


wherein

X is selected from the group consisting of hydrogen, fluoro, chloro, bromo, alkyl having 1 to 4 carbons, cycloalkyl having 3 to 7 carbons, alkoxy having 1 to 4 carbons, alkylthio having 1 to 4 carbons, trifluoromethyl, alkylsulfinyl having 1 to 4 carbons, alkylsulfonyl having 1 to 4 carbons, nitro, phenyl, alkanoyl having 2 to 4 carbons, benzoyl, thenoyl, alkanamido having 2 to 4 carbons, benzamido and N,N-dialkylsulfamoyl having 1 to 3 carbons in each of said alkyls; and Y is selected from the group consisting of hydrogen, fluoro, chloro, bromo, alkyl having 1 to 4 carbons, cycloalkyl having 3 to 7 carbons, alkoxy having 1 to 4 carbons, alkylthio having 1 to 4 carbons and trifluoromethyl;

or X and Y when taken together are a 4,5-, 5,6- or 6,7-methylenedioxy group or a 4,5-, 5,6- or 6,7-ethylenedioxy group;

or X and Y when taken together and when attached to adjacent carbon atoms, form a divalent radical Z, wherein Z is selected from the group consisting of



wherein W is oxygen or sulfur.

4,556,673

USE OF PHTHALYLTAURINE SULFONAMIDE DERIVATIVES IN TREATING EPILEPSY AND ARRYTHMIA

Lars H. Andersen, Linnankoskig. 10, Helsinki, Finland (SF-00250), and Leif A. Hildén, Skogvägen 14, Nickby, Finland (SF 04130)

PCT No. PCT/FI81/00037, § 371 Date Jan. 11, 1982, § 102(e) Date Jan. 11, 1982, PCT Pub. No. WO81/03492, PCT Pub. Date Dec. 10, 1981

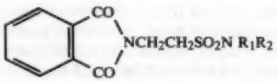
PCT Filed May 22, 1981, Ser. No. 342,018

Claims priority, application Sweden, Jun. 6, 1980, 8004261

Int. Cl.[4] A61K *31/40*; C07D *209/48, 403/12*

U.S. Cl. 514—414 **4 Claims**

1. A method of treating epilepsy in a mammal afflicted therewith, said method comprising administering to said mammal a therapeutically effective amount of a compound with the chemical structure:

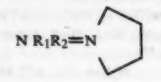


where

R_1=H

R_2=ethyl-,n-propyl-,isopropyl, or n-butyl

or where



4,556,674

2-IMINO-PYRROLIDINES, PROCESS FOR THEIR PREPARATION, AND THERAPEUTIC COMPOSITIONS CONTAINING SAME

Jacques G. Maillard, Versailles; Tri V. Van, Igny; Jacky M. Legeai, Palaiseau, and Marguerite M. Benharkate, Le Perray en Yvelines, all of France, assignors to Laboratoires Jacques Logeais, Issy les Moulineaux, France

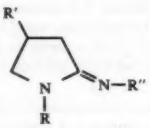
Filed Jan. 17, 1984, Ser. No. 571,524

Claims priority, application France, Jan. 28, 1983, 83 01360

Int. Cl.[4] C07D *207/14*

U.S. Cl. 514—426 **5 Claims**

1. A process for the treatment of thrombosis in a human in need of such treatment comprising administering to a human in need thereof an effective amount of a compound selected from the group consisting of a compound of the formula



(I)

in which:

R is selected from C_{1-4} alkyl; C_{2-4} alkenyl and C_{2-4} alkynyl,

R′ is selected from phenyl; phenyl mono-, di- or tri-ring-substituted with substituents selected from chlorine, fluorine, C_{1-4} alkyl, C_{1-4} alkoxy, hydroxy and cyano; methylene dioxy phenyl; 2-benzofuryl; phenoxy methyl; phenoxy methyl mono-, di- or tri-ring-substituted with substituents selected from chlorine, fluorine C_{1-4} alkyl, hydroxy and cyano and methylene dioxy phenoxy methyl,

R″ is selected from C_{1-4} alkyl; C_{2-4} alkenyl; C_{2-4} alkynyl; C_{1-4} hydroxyalkyl; (C_{1-4} alkoxy) (C_{1-4} alkyl); phenyl (C_{1-4} alkyl); phenoxy (C_{1-4} alkyl); phenyl (C_{1-4} alkyl) mono-, di- or tri-ring-substituted with substituents selected from chlorine, fluorine, C_{1-4} alkyl, C_{1-4} alkoxy, hydroxy and cyano; methylene dioxy phenyl (C_{1-4} alkyl); phenoxy (C_{1-4} alkyl) mono-, di- or tri-ring-substituted with substituents selected from chlorine, fluorine, C_{1-4} alkyl, C_{1-4} alkoxy, hydroxy and cyano and methylene dioxy phenoxy (C_{1-4} alkyl) and a pharmaceutically acceptable acid addition salt thereof, said amount being effective for the treatment of thrombosis.

4,556,675

7-OXABICYCLOHEPTANE AND 7-OXABICYCLOHEPTENE COMPOUNDS

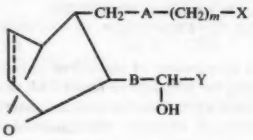
David L. Snitman, Boulder, Colo.; Martin F. Haslanger, Lambertville, and Peter W. Sprague, Pennington, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 378,547, May 17, 1982, which is a continuation-in-part of Ser. No. 319,511, Nov. 9, 1981, abandoned. This application Jul. 28, 1983, Ser. No. 518,245

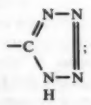
Int. Cl.[4] A61K *31/34*

U.S. Cl. 514—469 **19 Claims**

1. A composition for inhibiting arachidonic acid-induced platelet aggregation and bronchoconstriction comprising an effective amount of a compound having the structural formula



and including all stereoisomers thereof;
wherein
A and B may be the same or different and A is CH=CH or $(CH_2)_2$,
B is CH=CH, C=C, or $(CH_2)_2$; m is 1 to 8;
X is OH;



CO_2R^1 wherein R^1 is H or lower alkyl; or

wherein Z is H, lower alkyl, or aryl, SO_2—Q (wherein Q is lower alkyl or aryl),

or OR^2 wherein R^2 is H;
Y is aryl-lower alkyl; alkenyl containing 3 to 6 carbons; alkynyl containing 3 to 6 carbons; pyridyl, pyridyl-lower alkyl; pyridyl containing one or two halogen or lower alkyl substituents; thienyl; thienylalkyl; thienyl containing one or two halogen or lower alkyl substituents; cycloalkyl; cycloalkyl containing one or two halogen, lower alkyl or lower alkoxy groups on the ring; cycloalkylalkyl, cycloalkylalkyl containing one or two halogen, lower alkyl or lower alkoxy groups on the ring; or phenoxymethyl; wherein lower alkyl or alkyl by itself or as part of another group contains 1 to 12 carbons, aryl by itself or as part of another group contains 6 to 10 carbons in the ring portion, and cycloalkyl by itself or as part of another group contains 3 to 12 carbons in the ring portion;
and represents a single bond or double bond with the proviso that where represents a double bond, A is CH=CH and B is CH=CH or $(CH_2)_2$ and Y is other than alkenyl or alkynyl or a pharmaceutically acceptable salt thereof, and a pharmaceutically acceptable carrier therefor.

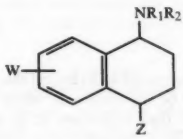
4,556,676

ANTIDEPRESSANT DERIVATIVES OF TRANS-4-PHENYL-1,2,3,4-TETRAHYDRO-1-NAPHTHALENAMINE

Willard M. Welch, Jr., Mystic; Charles A. Harbert, Waterford; B. Kenneth Koe, Gales Ferry, and Allen R. Kraska, East Lyme, all of Conn., assignors to Pfizer Inc., New York, N.Y.

Continuation-in-part of Ser. No. 90,237, Nov. 1, 1979, abandoned. This application Sep. 5, 1980, Ser. No. 184,447
The portion of the term of this patent subsequent to Aug. 20, 2002, has been disclaimed.
Int. Cl.[4] A61K *31/135, 31/205;* **C07C** *87/64*
U.S. Cl. 514—554 **22 Claims**

1. A compound selected from the group consisting of trans-isomeric bases of the formula



and the pharmaceutically acceptable acid addition salts thereof, wherein
R_1 is selected from the group consisting of hydrogen and methyl,
R_2 is methyl,
Z is selected from the group consisting of 3-chlorophenyl, 4-chlorophenyl, 3,4-dichlorophenyl, 3-bromophenyl and 4-bromophenyl, and
W is selected from the group consisting of hydrogen, fluoro, chloro, bromo, trifluoromethyl and alkoxy of from 1 to 3 carbon atoms,
with said compound being either the (1R)-enantiomer or the racemic mixture of the (1R)-enantiomer with the corresponding (1S)-enantiomer.

17. A method for combatting mental depression in a mentally-depressed subject by blocking the synaptosomal uptake of both serotonin and norepinephrine in the brain of said subject which comprises administering to said subject an effective amount of a compound of claim 1.

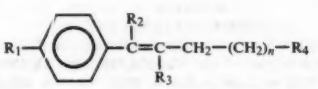
4,556,677

ALKANE AND ALKENE DERIVATIVES AND THEIR USE

Marja-Liisa Södervall; Kauko O. A. Kurkela; Arto J. Karjalainen; Reijo J. Toivola, all of Oulu; Lauri V. M. Kangas, Turku, and Guillermo L. Blanco, Oulu, all of Finland, assignors to Farmos Group Ltd., Turku, Finland

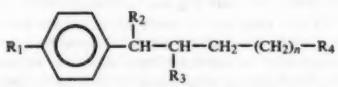
Filed Oct. 26, 1982, Ser. No. 436,805
Claims priority, application United Kingdom, Oct. 26, 1981, 8132240
Int. Cl.[4] C07C *43/205*
U.S. Cl. 514—651 **26 Claims**

1. A compound of the general formula:



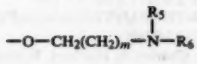
(I)

or



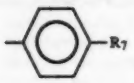
(II)

wherein R_1 is hydrogen, hydroxy, alkoxy of 1 to 4 carbon atoms, allyloxy, 2,3-epoxypropoxy, 2,3-dihydroxypropoxy, or



wherein one of R_5 and R_6 is hydrogen and the other an alkyl group of 1 to 4 carbon atoms or R_5 and R_6 are alkyl groups of 1–4 carbon atoms which may be the same or different or the $—NR_5R_6$ group stands for a nitrogen-containing 5 to 7 membered heterocyclic radical and m is 1 or 2;

R_2 is



wherein

R_7 has the same meanings as R_1 except that R_7 and R_1 cannot simultaneously be the same and, when R_1 is a radical as aforesaid other than hydrogen, R_2 is an alkyl of 1 to 4 carbon atoms; R_3 is cyclopentyl or hydroxycyclopentyl; R_4 is hydrogen or hydroxy and n is 0 to 3, and its non-toxic pharmaceutically acceptable salts and esters.

4,556,678

SUSTAINED RELEASE PROPRANOLOL TABLET

Charles H. Hsiao, Cooper City, Fla., assignor to Key Pharmaceuticals, Inc., Miami, Fla.

Filed Jun. 24, 1982, Ser. No. 391,929
Int. Cl.[4] A61K *31/135, 9/24*
U.S. Cl. 514—652 **2 Claims**

1. An oral sustained release dosage unit form tablet to provide a sustained release of propranolol over a prolonged period, said tablet consisting essentially of

a. a therapeutically effective amount of propranolol to provide a sustained release thereof over said prolonged period contained in

b. compressed granules consisting essentially of

1. from about 0.1 to about 10 parts by weight hydroxypropyl methylcellulose having a molecular weight of from about 20,000 to about 140,000;

2. about one part by weight hydroxypropyl cellulose having a molecular weight of from about 60,000 to about 300,000; and

3. a lubricant for said granules.

4,556,679

EARTHWORM IRRITANT

Peter L. Koehler, 7 Bevell La., North Syracuse, N.Y. 13212

Continuation-in-part of Ser. No. 574,719, Jan. 30, 1984, abandoned. This application Jan. 4, 1985, Ser. No. 688,877
Int. Cl.[4] A01N *27/00*
U.S. Cl. 514—764 **1 Claim**

1. A composition for inducing earthworms to come out of the ground so that they can be easily collected for bait, said composition having a relatively slow evaporation rate and consisting essentially of approximately 85% by volume of 1,2,4-trimethylbenzene and approximately 14% by volume of a nonionic surfactant, the surfactant being comprised of approximately 35% nonylphenol and approximately 65% ethylene oxide.

4,556,680

METHOD OF PRODUCING ANTISTATIC EXPANDABLE POLYSTYRENE PRODUCTS

Mark C. Braemer, West Trenton, N.J., assignor to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Aug. 30, 1983, Ser. No. 527,900
Int. Cl.[4] C08J *9/22*
U.S. Cl. 521—57 **5 Claims**

1. A process for the preparation of static-free polystyrene beads comprising, treating the polystyrene beads with an effective amount of an antistatic agent wherein said antistatic agent is added to a pre-expansion chamber simultaneously with steam.

4,556,681

POLYCARBONATE RESIN FOAM

Frank N. Liberti, Mt. Vernon, Ind., and Gerald F. Macke, Wichita, Kans., assignors to General Electric Company, Pittsfield, Mass.

Filed Jan. 2, 1985, Ser. No. 688,371
Int. Cl.[4] C08J *9/10, 9/14*
U.S. Cl. 521—90 **6 Claims**

1. A method for producing a foamed polycarbonate article comprising a step of heating and foaming a polycarbonate resin composition comprising a polycarbonate resin, a blowing agent, and an impact enhancing amount of from about 0.2% to about 1.0% by weight of resin content of an epoxy compound provided that the resin composition contains greater than about 0.02% by weight water.

4,556,687

POLYIMIDE COMPOSITIONS AND FOAMS AND METHODS OF MAKING SAME

John Gagliani, 6280 Lance Pl., San Diego, Calif. 92120, and John V. Long, 1756 E. Lexington Ave., El Cajon, Calif. 92021

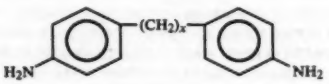
Division of Ser. No. 705,129, Feb. 25, 1985. This application May 23, 1985, Ser. No. 737,083
Int. Cl.[4] C08J *9/02*
U.S. Cl. 521—185 **3 Claims**

1. A liquid polyimide foam precursor composition suitable for use in the manufacture of non-friable polyimide foams, prepared by esterifying an aromatic dianhydride with an esterifying solvent of produce a half-ester and reacting said half-ester with a diamine to produce a polyimide precursor composition;

the improvement wherein:

said diamine consists of a mixture of at least one aromatic-aliphatic diamine and from 0.1 to 50 mole % of at least one aliphatic diamine;

said aromatic-aliphatic diamine having the general formula:



wherein

x is a positive integer from 1 to 20; and

said aliphatic diamine has the general formula:

$$H_2N—(CH_2)_y—NH_2$$

wherein

y is a positive integer from 2 to 12.

4,556,683

PIGMENT DISPERSING RESIN AND COMPOSITION CONTAINING SAME

Yoji Hirasawa, Kyoto, and Shoji Ikeda, Hirakata, both of Japan, assignors to Nippon Paint Co., Ltd., Osaka, Japan

Filed Aug. 18, 1983, Ser. No. 524,396
Claims priority, application Japan, Dec. 31, 1982, 57-234171
Int. Cl.⁴ C08L *63/00*
U.S. Cl. 523—447 **10 Claims**

1. A pigment dispersed paste which comprises a resin for dispersing a pigment therein, which resin consists essentially of a modified polymer obtained by introducing at least one of acidic groups and basic groups into a polymeric polyol of star-shaped structure prepared by reacting a polyol having at least four hydroxyl groups per molecule with an alkylene oxide, said acidic groups being carboxyl or sulfonic groups and said basic groupd comprising a nitrogen atom bearing a non-covalent electron pair.

4,556,684

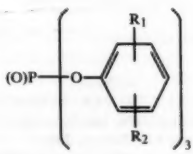
FLAME RETARDANT STYRENE MODIFIED POLYPHENYLENE ETHER RESINS

Louis T. Gunkel, Yardley, Pa., and Charles V. Juelke, Belle Mead, N.J., assignors to FMC Corporation, Philadelphia, Pa.

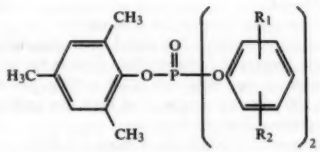
Filed Aug. 27, 1984, Ser. No. 644,409
Int. Cl.⁴ C08K *5/52*
U.S. Cl. 524—141 **4 Claims**

1. A liquid mixture of lower alkyl substituted triphenyl phosphates consisting essentially of the following components (by weight):

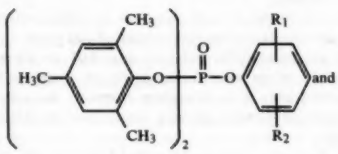
(a) about 1.5% to about 3.0% of:



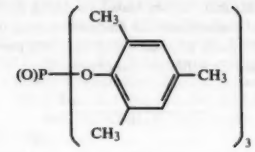
(b) about 15.0% to about 20.0% of:



(c) about 23.0% to about 28.0% of:



(d) about 47.0% to about 56.0% of:



wherein R_1 and R_2 are each selected from the class consisting of hydrogen, methyl and ethyl, it being understood that when one of R_1 and R_2 is hydrogen the other is ethyl and when one of R_1 and R_2 is methyl the other is methyl, the resulting two methyl groups being in the 2,4-, 2,5-, 2,3-, 3,4- and 3,5-positions, it being further understood that the ethyl groups are almost entirely in the meta (m) and para (p) positions.

4,556,685

POLYPHENYLENE ETHER RESIN COMPOSITION

Akitoshi Sugio, Ohmiya; Masanobu Masu, Osaka, and Toshihiko Kobayashi, Showa, all of Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Filed Oct. 10, 1984, Ser. No. 660,428
Claims priority, application Japan, Oct. 13, 1983, 58-191384
Int. Cl.⁴ C08K *5/52*
U.S. Cl. 524—141 **2 Claims**

1. A polyphenylene ether resin composition comprising

(A) a polyphenylene ether resin,

(B) a polystyrene resin,

(C) an acrylonitrile/conjugated diene elastomeric copolymer,

(D) a graft copolymer obtained by reacting butyl rubber and an unsaturated polyolefin in a bifunctional phenol as a reaction medium, and

(E) an aromatic phosphate wherein the resin composition comprises 60 to 90% by weight of component (A), 10 to 30% by weight of component (B), 2 to 15% by weight of component (C), 2 to 10% by weight of component (D) and 5 to 20 parts by weight of component E per 100 parts by weight of components (A), (B), (C) and (D) combined.

4,556,686

STABLE CROSSLINKED DISPERSION

Stanley K. Horvath, Rochester, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Continuation of Ser. No. 600,204, Apr. 16, 1984, abandoned, which is a continuation of Ser. No. 200,222, Oct. 23, 1980, abandoned. This application Jun. 20, 1985, Ser. No. 746,942
Int. Cl.⁴ C08K *5/10, 3/10;* **C08L** *61/00, 51/00*
U.S. Cl. 524—315 **14 Claims**

1. A stable crosslinked dispersion containing microgel particles, said dispersion being:

(i) formed by addition polymerization of

(a) between about 1 and about 10 mole percent each of first and second ethylenically unsaturated monomers, each bearing functionality capable of crosslinking reaction with the other, and

(b) between about 80 and about 98 mole percent of at least one other monoethylenically unsaturated monomer

in the presence of (I) a hydrocarbon dispersing liquid which is a solvent for the polymerizable monomers, but a non-solvent for the resultant polymer, and (II) polymeric dispersion stabilizer containing at least two segments, with one segment being solvated by said dispersing liquid and the second segment being of different polarity than said first segment and relatively insoluble in said dispersing liquid, wherein the reaction is carried out at elevated temperature such that the dispersion polymer first forms and then is crosslinked; and

(ii) stabilized further by inclusion therein of a further stabilizer which, except for solvent, consists essentially of

butylated melamine formaldehyde resin have a number average molecular weight in the range of about 700 to about 2,500, said further stabilizer being included in said crosslinked dispersion in an amount ranging from about 25 to about 75 parts of resin solids per 100 parts total resin solids in said crosslinked dispersion.

4,556,687

COLOR DEVELOPER FOR PRESSURE-SENSITIVE RECORDING PAPERS

Theodore Maierson, Dayton, Ohio, assignor to The Standard Register Company, Dayton, Ohio

Filed Mar. 19, 1984, Ser. No. 590,842
Int. Cl.[4] B41M *5/16, 5/22*
U.S. Cl. 524—333 **14 Claims**

1. A color developer for colorless dye precursors comprising the chelation product of zinc bromide and 4,4'-dihydroxyldiphenyl sulfone.

4,556,688

THERMOPLASTIC POLYETHERIMIDE ESTER ELASTOMERS

Russell J. McCready, and John A. Tyrell, both of Mt. Vernon, Ind., assignors to General Electric Company, Pittsfield, Mass.

Continuation-in-part of Ser. No. 665,277, Oct. 26, 1984. This application Jan. 11, 1985, Ser. No. 691,028
Int. Cl.[4] C08G *63/76;* **C08L** *67/00*
U.S. Cl. 525—33 **21 Claims**

1. A polyetherimide ester composition comprising the reaction product of

(a) one or more diols,

(b) one or more dicarboxylic acids

(c) one or more high molecular weight poly(oxy alkylene) diamines and

(d) one or more tricarboxylic acids or derivatives thereof.

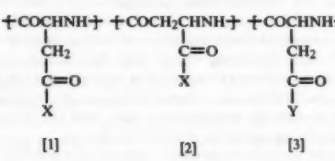
4,556,689

COMPLEX OF BIOLOGICALLY ACTIVE PROTEIN WITH REACTIVE HIGH POLYMER HAVING BONDED THERETO BIFUNCTIONAL CHELATE

Yoshiaki Murakami, Takatsuki; Kunio Shiba, Takarazuka; Akira Yoshitake, Kyoto; Keietsu Takahashi, Itami; Nobuo Ueda, Kawanishi, and Masaaki Hazue, Amagasaki, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

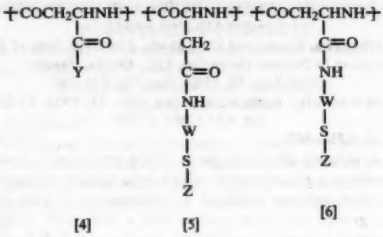
Filed May 17, 1984, Ser. No. 611,117
Claims priority, application Japan, May 23, 1983, 58-91217
Int. Cl.[4] C08G *69/48, 69/10, 69/42*
U.S. Cl. 525—54.1 **13 Claims**

1. A protein-polysuccinimide complex wherein a biologically active protein is combined with a polysuccinimide [I] having a mean molecular weight of 2,000 to 1,000,000 and consisting of constitutive units represented by the formulae:



[1] [2] [3]

-continued



[4] [5] [6]

wherein

X represents a residue of a bifunctional chelate having an amino group in the molecule;

Y represents a water soluble aliphatic primary amine residue;

W represents a lower alkylene group;

Z represents a hydrogen atom or a group represented by the symbol Z', provided that when Z is a hydrogen atom, the —SH group represented by —SZ may intramolecularly or intermolecularly form a —S—S— bond with another —SH group in equilibrium; and these are also represented by —SH; and

Z' represents a group which can form an active disulfide bond with the adjacent sulfur atom, the numbers of the respective constitutive units represented by the formula [1], [2], [3], [4], [5] and [6] in one molecule being n, m, l, r, p and q, respectively, which denote 0 or natural numbers and have the following relationships;

$$n+m \geqq 2$$

$$0.001 \leqq (p+q)/(n+m+l+r+p+q) \leqq 0.50.$$

4,556,690

ACETAL RESIN COMPOSITION

Mikio Nakagawa, Hiroshima, Japan, assignor to Mitsui Petrochemical Industries, Ltd, Tokyo, Japan

Filed May 3, 1984, Ser. No. 606,613
Claims priority, application Japan, May 10, 1983, 58-80144; Jan. 13, 1984, 59-3531
Int. Cl.[4] C08L *29/14, 51/06*
U.S. Cl. 525—64 **18 Claims**

1. An acetal resin composition comprising

(A) 100 parts by weight of an acetal resin containing at least 80 mole percent of oxymethylene units in the main chain and having a melt flow rate of 0.1 to 50 g/10 min., and

(B) 1 to 200 parts by weight of at least one graft modified alpha-olefin polymer which has

(a) a degree of crystallinity of from 0 to 85%,

(b) an intrinsic viscosity in decalin at 135° C. of from 0.5 to 7 dl/g, and

(c) a molecular weight distribution ($\overline{Mw}/\overline{Mn}$) of from 1.5 to 30, and

(d) wherein the at least one graft modified polymer is a graft-copolymerization product of 100 parts by weight of an alpha-olefin polymer and 0.01 to 10 parts by weight of an unsaturated mono or dicarboxylic acid having from 3 to 20 carbon atoms or the anhydrides, lower alkyl esters, amides, imides and halides thereof, and

(e) is dispersed in the acetal resin (A) as particles having a particle size of not more than 10 microns.

4,556,691

THERMOPLASTIC RUBBER CONSISTING OF A MIXTURE OF POLYPROPYLENE, HIGH-IMPACT POLYSTYRENE AND A STYRENE/DIENE BLOCK COPOLYMER

Jean Castelein, Mellery, Belgium, assignor to Montefina S.A., Belgium

Continuation of Ser. No. 356,660, Mar. 10, 1982, abandoned. This application Feb. 14, 1984, Ser. No. 580,062
Claims priority, application Italy, Mar. 12, 1981, 20315 A/81
Int. Cl.[4] C08L *53/02, 51/04, 23/12*
U.S. Cl. 525—71 3 Claims

1. A thermoplastic synthetic rubber consisting of a mixture containing from 10 to 45% by weight of crystalline polypropylene, from 10% to 45% by weight of high-impact polystyrene and from 50% to 80% by weight of a styrene/diene block copolymer of the linear type, in which the dienic monomer is either butadiene or isoprene, said block copolymer having a structure of three or more sequences, being represented by the formula S-(D-S)$_n$ wherein n is an integer, wherein S=styrene, D=butadiene or isoprene, said rubber having a styrene content below 50% by weight.

4,556,692

THERMOPLASTIC RESIN COMPOSITION HAVING EXCELLENT IMPACT RESISTANCE AND HEAT RESISTANCE

Kazuo Kishida; Naoki Yamamoto, both of Hiroshima, and Yasumasa Sato, Tokorozawa, all of Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Filed Nov. 30, 1984, Ser. No. 676,810
Claims priority, application Japan, Dec. 1, 1983, 58-227537; Dec. 2, 1983, 58-227845
Int. Cl.[4] C08F *265/02*
U.S. Cl. 525—78 13 Claims

1. A thermoplastic resin composition having excellent impact resistance and heat resistance which comprises 5 to 95% by weight of a graft copolymer (I) obtained by polymerizing 93 to 30 parts by weight of a monomer or a monomer mixture for grafting comprising 30 to 100% by weight of at least one monomer selected from the group consisting of styrene, α-methylstyrene, acrylonitrile and methyl methacrylate and 0 to 70% by weight of at least one copolymerizable monomer having a $CH_2{=}C<$ group in the presence of 7 to 70 parts by weight (in terms of solid) of a rubber latex of agglomerated particles having a particle diameter of at least 0.2 μm obtained by adding 0.1 to 5 parts by weight (in terms of solid) of an acid-group containing copolymer (B) latex obtained from 3 to 30% by weight of an acid-group containing monomer, 97 to 35% by weight of at least one alkyl acrylate having 1 to 12 carbon atoms in the alkyl group, and 0 to 48% by weight of at least one monovinyl monomer copolymerizable therewith (100% by weight in total) to 100 parts by weight (in terms of solid) of a rubber (A) latex of small particle size having a pH of 7 or above obtained from 100 to 50% by weight of 1,3butadiene and 0 to 50% by weight of other copolymerizable monomer having a $CH_2{=}C<$ group (100% by weight in total); 95 to 5% by weight of a thermoplastic resin (II) obtained by polymerizing α-methylstyrene and at least one of other copolymerizable monomer having $CH_2{=}C<$ group; and 0 to 50% by weight of another thermoplastic resin (III) containing no α-methylstyrene unit, said components (I), (II) and (III) being compounded so as to give a content of said butadiene rubber (A) in the whole composition of 3 to 40% by weight and a content of α-methyltyrene unit in the whole composition of 10 to 75% by weight.

4,556,693

ADDITIVE FOR IMPROVING WEATHERING RESISTANCE AND DECREASING VISCOSITY OF HIGH SOLIDS COATINGS

Richard J. Corcoran, Somerville; Peter W. Kopf, Hillsborough, and Donald F. Smith, Jr., Bridgewater, all of N.J., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Aug. 3, 1984, Ser. No. 637,473
Int. Cl.[4] C08L *61/28, 67/04*
U.S. Cl. 525—162 14 Claims

1. Improved high solids coating compositions containing an hydroxy functional acrylic copolymer base resin and having higher total solids content and when cured, with enhanced weathering resistance and hardness, where the improvement comprises replacing part of the acrylic base resin with a binary reactive diluent comprising:

(1) a reactive acrylic oligomer having the formula X_aY_b wherein X is an hydroxyalkyl acrylate or methacrylate, Y is an alkylacrylate or methacrylate, each of the alkyl groups having about 1 to 6 carbon atoms and each of "a" and "b" having values of about 4 to about 14; and

(2) a polycaprolactone hexol wherein the weight ratio of oligomer (1) to polycaprolactone hexol (2) is in the range of about 1:1 to about 4:1 and the weight ratio of reactive acrylic oligomer plus polycaprolactone hexol to acrylic base resin is in the range of about 1:1 to about 1:9.

4,556,694

LOW TEMPERATURE FLEXIBLE PVC BLENDS

Lawrence R. Wallace, Ponca City, Okla., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jul. 26, 1984, Ser. No. 634,721
Int. Cl.[4] C08L *23/34, 23/28, 27/06*
U.S. Cl. 525—239 8 Claims

1. A method for improving the low temperature brittle point properties of non-rigid poly(vinyl chloride) compositions containing from 40 to 85 parts PVC comprising adding to said poly(vinyl chloride) compositions from 1 to 50 parts of chlorosulfonated polyethylene, wherein said base polyethylene has a density of at least 0.94 and from 1 to 50 parts of chlorinated polyethylene, wherein said base polyethylene has a density of at least 0.94, and wherein the total amount of chlorinated polyethylene and chlorosulfonated polyethylene does not exceed 60% by weight of the polymer present.

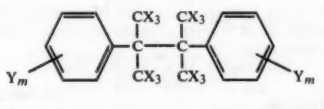
4,556,695

PROCESS FOR THE DEGRADATION OF (CO)POLYMERS OF PROPYLENE

Klaas Ijntema, Dieren, Netherlands, assignor to Akzo N.V., Arnhem, Netherlands

Filed Jun. 25, 1984, Ser. No. 624,282
Claims priority, application Netherlands, Jul. 11, 1983, 8302462
Int. Cl.[4] C08F *8/50*
U.S. Cl. 525—359.6 4 Claims

1. A process for the degradation of polymers or copolymers of polypropylene, comprising carrying out said degradation in the absence of a flame retardant amount of an organic bromine compound and in the presence of a compound of the formula



wherein X represents a chlorine atom or a hydrogen atom with the proviso that the compound contains 1 to 3 chlorine atoms, Y is an unsubstituted alkyl group having 1 to 4 carbon atoms and m=0–4.

4,556,696

PROCESS TO FORM FILM FROM BLENDS OF POLYCAPROLACTAM AND POLY(HEXAMETHYLENE ADIPAMIDE)

Donald F. Stewart, Whippany; Michael F. Tubridy, Budd Lake, and Herbert J. Huthwaite, Florham Park, all of N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Apr. 26, 1984, Ser. No. 604,256
Int. Cl.[4] C08G *69/48*; C08L *77/00*
U.S. Cl. 525—432 **10 Claims**

1. A process to form a film from a composition comprising from 5 to 30 percent polycaprolactam and from 50 to 95 percent poly(hexamethylene adipamide) comprising the steps of: heating the composition to from about 440° F. (227° C.) to about 485° F. (252° C.), and forming the composition into a film.

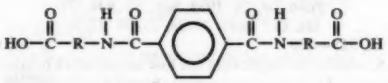
4,556,697

ALTERNATING COPOLYAMIDE PREPARED ON A POLYMER MATRIX

Benedict S. Curatolo, Maple Heights, and Gerald P. Coffey, Lyndhurst, both of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed Jul. 25, 1983, Ser. No. 517,163
Int. Cl.[4] C08G *69/28*
U.S. Cl. 525—434 **10 Claims**

1. A process for producing a nylon-type polyamide comprising contacting a non-wholly aromatic dicarboxylic acid diamide derivative of terephthalic acid of the formula:



and a diamine of the formula

$$H_2N-R'-NH_2$$

where each R is independently an aliphatic or alicyclic divalent radical and R′ is an aliphatic or alicyclic divalent radical, in contact with a polymer matrix and a polycondensation catalyst.

4,556,698

FLAME RETARDANT THERMOPLASTIC POLYCARBONATE POLYMERS

Diza P. Braksmayer, Cranbury, N.J., assignor to FMC Corporation, Philadelphia, Pa.

Filed Dec. 3, 1984, Ser. No. 677,447
Int. Cl.[4] C08G *63/62*
U.S. Cl. 525—469 **11 Claims**

1. A flame retardant phosphorous-containing polycarbonate composition produced by carrying out a polycarbonate condensation in which at least part of the diol compound is a bishydroxyalkylphosphine oxide.

4,556,699

PROCESS FOR THE PRODUCTION OF POLYPHENYLENE OXIDE

Jan Bialy; Irena Penczek; Stanislaw Maczenski, and Marek Borensztajn, all of Warsaw, Poland, assignors to Enichimica S.p.A., Milan, Italy

Filed Dec. 3, 1984, Ser. No. 677,166
Int. Cl.[4] C08G *65/44, 65/46*
U.S. Cl. 526—68 **7 Claims**

1. Process for the preparation of polyphenylene oxide by means of polymerization of 2,6-xylenol, with oxygen, or with a gas containing molecular oxygen, in the presence of a catalyst, within a liquid reaction medium in which the catalyst and the monomer are soluble, and polyphenylene oxide is insoluble or substantially insoluble, characterized in that:

(a) to the bottom of a vertical and elongated reaction vessel monomer and an amount of the catalyst effective to polymerize the monomer is continuously fed dissolved in a liquid solvent, or in a mixture of liquid solvents, incapable of dissolving the polyphenylene oxide;

(b) to the bottom of said reaction vessel a gaseous stream of oxygen, or of gas containing molecular oxygen is continuously fed in while maintaining the temperature below 35° C. by using a heat exchanger;

(c) at the top of said reaction vessel, recovering a dispersion of solid polyphenylene oxide in the liquid reaction mixture;

(d) recovering a portion of said dispersion, with the catalyst and the 2,6-xylenol,, and recycling such portion to the bottom of said reaction vessel while maintaining a weight ratio of the recycled portion to the fresh feed of at least 100/1; and

(e) recovering the polyphenylene oxide from the remaining portion of said dispersion that is recovered from the top of the reaction vessel.

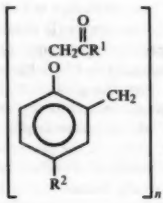
4,556,700

INSTANT ADHESIVE COMPOSITION UTILIZING CALIXARENE ACCELERATORS

Stephen J. Harris; M. Anthony McKervey; David P. Melody; John Woods, all of Dublin, and John M. Rooney, Kildare, all of Ireland, assignors to Loctite Limited, Dublin, Ireland

Continuation-in-part of Ser. No. 575,257, Jan. 30, 1984, abandoned. This application Nov. 21, 1984, Ser. No. 673,621
Int. Cl.[4] C08F *4/00, 20/34*
U.S. Cl. 526—209 **7 Claims**

1. In a cyanoacrylate adhesive composition, the improvement comprising that the composition includes an accelerator compound in a conventional amount, the accelerator compound being a calixarene compound stable to cyanoacrylate monomers represented by the formula:



where an R^1 is alkyl, alkoxy substituted alkyl or substituted alkoxy; R^2 is H or alkyl; and n=4,6 or 8.

4,556,701

IMPREGNANT COMPOSITIONS FOR POROUS SUBSTRATES

Frederick J. Schindler, Fort Washington, and Raymond L. Fulton, Jr., Feasterville, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed Mar. 30, 1984, Ser. No. 595,068
Int. Cl.[4] C08F *20/40, 20/10*
U.S. Cl. 526—282 **11 Claims**

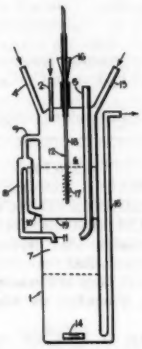
1. A nonaqueous composition for impregnating cementious substrates comprising at least one monomer selected from the group consisting of dicyclopentenyl- and dicyclopentenyloxy(C_1–C_4)alkyl acrylates and methacrylates and at least about four percent by weight of the composition of a component selected from the drying oil fatty acids and mixtures thereof.

4,556,702

OLIGOMERS AND HOMOPOLYMERS OF META- OR PARA-ISOPROPENYL-α,α-DIMETHYLBENZYLISOCYANATE

Frederic C. Schaefer, Darien, Conn., assignor to American Cyanamid Company, Stamford, Conn.

Filed Jun. 1, 1983, Ser. No. 499,921
Int. Cl.⁴ C08F *12/26*
U.S. Cl. 526—310 **15 Claims**



1. A method of forming oligomers or homopolymers of meta- or para-isopropenyl-α,α-dimethylbenzylisocyanate comprising:

(a) solution polymerizing meta- or para-isopropenyl-α,α-dimethylbenzylisocyanate in a solvent selected from the group consisting of methylene chloride, toluene, and mixtures thereof, at a temperature of from about −80° C. to about −25° C. in the presence of a catalytically effective amount of a polymerization catalyst selected from the group consisting of: Bronsted acids and Lewis acids; and

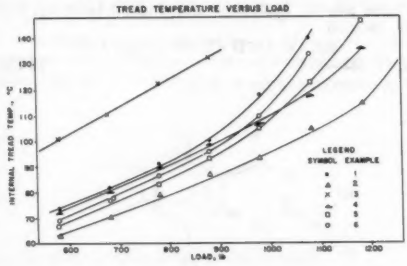
(b) neutralizing said polymerization catalyst at a temperature of from about −80° C. to about 10° C., thereby preventing substantial formation of isocyanic acid.

4,556,703

LOW HEAT BUILDUP POLYURETHANE COMPOSITIONS AND ARTICLES

Ignazio S. Megna, Lebanon, and Curtis A. Franz, Piscataway, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed May 14, 1984, Ser. No. 609,662
Int. Cl.⁴ C08G *18/76, 18/10, 18/16*
U.S. Cl. 528—49 **26 Claims**



1. A polyurethane elastomer composition, having low heat buildup characteristics, comprising the reaction product of:

(a) a polyurethane prepolymer having terminally reactive isocyanate groups and formed as a reaction product of polymeric diol with a stoichiometric excess of a mixture of the 2,6- and 2,4- isomers of tolylene diisocyanate, wherein said mixture contains from about 50 to about 90 wt. %, based on the weight of the isomeric mixture, of the 2,6-isomer, with

(b) a curatively effective amount of an aromatic diamine selected from the group consisting of 4,4'-methylenebis(o-chloroaniline); 4,4'-methylenebisaniline; 1,2-bis(2-aminophenylthio)ethane: and trimethylene glycol-di-p-aminobenzoate, in the presence of

(c) optionally, from about, 0.01 to 1 part of catalyst per hundred parts of prepolymer, said catalyst being selected from the group consisting of mono and dicarboxylic acids, metal salts of mono and dicarboxylic acids, carboxylic acid anhydrides and tertiary amines.

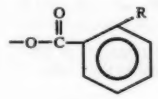
4,556,704

COMPOSITION

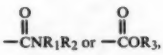
Niles R. Rosenquist, Evansville, Ind., assignor to General Electric Company, Mt. Vernon, Ind.

Filed Oct. 17, 1984, Ser. No. 661,789
Int. Cl.⁴ C08G *63/62*
U.S. Cl. 528—196 **8 Claims**

1. A composition comprising an end-capped aromatic carbonate polymer wherein the end-cap is of the structure



wherein R is



wherein R_1 and R_2 are the same or different and are alkyl of one to six carbon atoms, inclusive; cycloalkyl of four to seven carbon atoms, inclusive; phenyl; one to three alkyl substituted phenyl each alkyl having one to three carbon atoms, inclusive; or R_1 and R_2 taken together with the nitrogen to which they are attached form a ring of four to six carbon atoms; and wherein R_3 is alkyl of one to ten carbon atoms, inclusive; or cycloalkyl of four to eight carbon atoms, inclusive.

4,556,705

THERMOPLASTIC POLYETHERIMIDE ESTER ELASTOMERS

Russell J. McCready, Mt. Vernon, Ind., assignor to General Electric Company, Pittsfield, Mass.

Filed Oct. 26, 1984, Ser. No. 665,277
Int. Cl.⁴ C08G *69/44*
U.S. Cl. 528—289 **27 Claims**

1. A polyetherimide ester composition comprising the reaction product of

(a) one or more low molecular weight diols,

(b) one or more dicarboxylic acids, and

(c) one or more polyoxyalkylene diimide diacids.

4,556,706

HEAVY METAL-CONTAINING FORMAZANE DYES CONTAINING A FIBER-REACTIVE FLUOROTRIAZINE GROUP

Gert Hegar, Schünenbuch, and Herbert Seiler, Riehen, both of Switzerland, assignors to Ciba Geigy Corporation, Ardsley, N.Y.

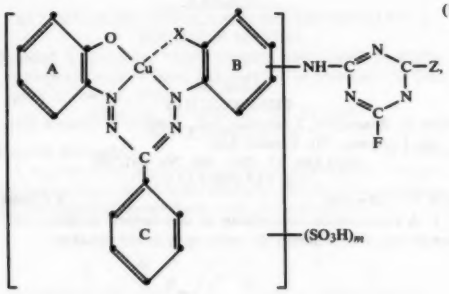
Continuation of Ser. No. 944,054, Sep. 19, 1978, abandoned, which is a continuation of Ser. No. 840,428, Oct. 7, 1977, abandoned, which is a continuation of Ser. No. 639,321, Dec. 10, 1975, abandoned. This application Apr. 28, 1980, Ser. No. 144,140

Claims priority, application Switzerland, Dec. 20, 1974, 17039/74

Int. Cl.[4] C09B *62/018, 62/038, 62/095;* D06P *1/382*

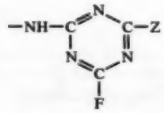
U.S. Cl. 534—618 7 Claims

1. A dyestuff of the formula



(I)

wherein the phenyl rings, A, B and C in addition to sulfo groups and the radical of the formula



(3)

are unsubstituted or substituted by low-molecular alkyl, low-molecular alkoxy, halogen, low-molecular alkylsulfonyl and sulfamoyl and optionally contains a fused phenyl ring, X is hydroxy, carboxy or sulfo, Z is fluoro, —NH_2, a mono- or dialkylamino group with at most 6 carbon atoms, which is unsubstituted or substituted by hydroxy and sulfo, N-methyl-N-phenylamino, N-sulfomethyl-N-phenylamino, phenylamino which is unsubstituted or substituted by sulfo, carboxy, methyl, sulfomethyl and chloro or naphthylamine, which is substituted by sulfo, morpholino or piperidino and m is a positive integer from 2 to 5.

4,556,707

TRIAZOLE-GROUP-CONTAINING DISAZO REACTIVE DYESTUFF

Hermann Henk, Cologne, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

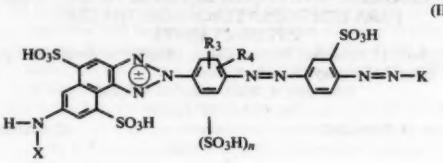
Filed Feb. 1, 1984, Ser. No. 576,056

Claims priority, application Fed. Rep. of Germany, Feb. 25, 1983, 3306696

Int. Cl.[4] C09B *62/09, 62/25, 62/475, 62/493*

U.S. Cl. 534—635 2 Claims

1. A reactive dyestuff of the formula



(III)

wherein

X is a triazine or pyrimidine reactive group;

R_3 and R_4 are each hydrogen, C_1–C_4-alkyl or C_1–C_4-alkoxy

n is 0 or 1; and

K is a pyridone or pyrimidone coupling component.

4,556,708

SMOKE-PERMEABLE, NON-REINFORCED FILM BASED ON REGENERATED CELLULOSE FOR MANUFACTURING SAUSAGE CASINGS

Klaus Andrae, Zornheim; Max Bytzek, Wiesbaden-Naurod; Elfried Hutschenreuter, Bad Schwalbach, and Hans U. Lang, Wiesbaden, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed May 21, 1984, Ser. No. 612,342

Claims priority, application Fed. Rep. of Germany, May 25, 1983, 3318906

Int. Cl.[4] A22C *13/00;* F16L *11/00;* C08B *16/00*

U.S. Cl. 536—57 11 Claims

1. A smoke-permeable, non-reinforced film comprising a regenerated cellulose film produced by precipitating a viscose web with a heated casting solution comprising, per liter of solution, at least about 160 g of sulfuric acid and at least about 300 g of sodium sulfate, wherein the sulfuric acid/sodium sulfate molar ratio ranges from about 0.7 to 0.9, wherein said film has a tear strength of from about 18 to 30 N/mm^2, as measured in the wet state (water content of from about 60 to 70 percent by weight, based on the total weight of the film), in both the longitudinal and transverse directions, and a degree of orientation in the range of from about 1 to 1.2.

4,556,709

2-AMINO-8-CYCLOPROPYL-5-OXO-5,8-DIHYDRO-PYRIDO[2,3-D]-PYRIMIDINE-6-CARBOXYLIC ACID COMPOUNDS

Klaus Grohe, Odenthal; Hans-Joachim Zeiler, Velbert, and Karl G. Metzger, Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

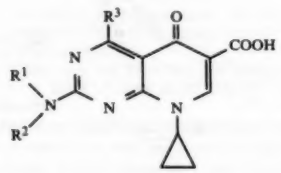
Continuation of Ser. No. 111,057, Jan. 10, 1980, abandoned. This application Jul. 26, 1982, Ser. No. 401,684

Claims priority, application Fed. Rep. of Germany, Feb. 1, 1979, 2903850

Int. Cl.[4] C07D *471/04;* A61K *31/505*

U.S. Cl. 544—117 11 Claims

1. A compound of the formula



(I)

or a therapeutically useful acid-addition salt thereof, in which R^1 is alkyl having 1 to 12 carbon atoms, optionally substituted by alkoxy having 1 to 4 carbon atoms or dialkyl-

amino having 1 to 3 carbon atoms per alkyl radical; or alkenyl having 2 to 12 carbon atoms,

R^2 is hydrogen; alkyl having 1 to 12 carbon atoms or hydroxyalkyl having 1 to 12 carbon atoms;

R^1 and R^2 taken together with the nitrogen atom on which they are substituents and, optionally, with a further hetero atom selected from oxygen, sulphur or NR_4, form a 5- to 7-membered ring which is optionally substituted on a carbon atom by 1 to 4 C_1–C_2-alkyl groups,

R^4 is hydrogen; C_1 to C_6 alkyl, optionally substituted by hydroxy, alkoxy, alkylmercapto or dialkylamino group with 1 to 3 carbon atoms per alkyl radical or alkoxycarbonyl with 1 to 4 carbon atoms in the alkoxy moiety; cycloalkyl with 3 to 7 carbon atoms; phenylalkyl which has up to 4 carbon atoms in the aliphatic part and is unsubstituted or substituted in the phenyl part by halogen, C_1–C_3-alkyl, C_1–C_3-alkoxy, C_1–C_3-alkylmercapto, phenoxy, phenylmercapto, trifluoromethyl, nitro, cyano or carboxylic acid ester with 1 to 4 carbon atoms in the alcohol part; phenyl or pyridyl, pyrimidyl, thiazolyl or benzthiazolyl or alkoxycarbonyl which has 1 to 4 carbon atoms in the alkoxy moiety; or alkanoyl with 1 to 6 carbon atoms; phenyl-carbonyl; or aminosulphonyl; and

R^3 is hydrogen or alkyl having up to 3 carbon atoms.

4,556,710

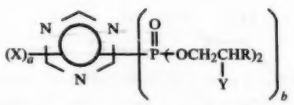
PRIMARY HYDROXYL-CONTAINING PHOSPHONO-S-TRIAZINES

Chester E. Pawloski, Bay City, and Sally P. Ginter, Sanford, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Mar. 18, 1983, Ser. No. 476,663
Int. Cl.[4] C07D 251/12
U.S. Cl. 544—214 **21 Claims**

1. Phosphono-s-triazines corresponding to the formula

I



wherein:

X is separately in each occurrence chlorine, bromine, haloalkyl or alkyl;

Y is separately in each occurrence hydrogen, chlorine or bromine;

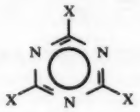
R is separately in each occurrence hydrogen, hydrocarbyl, CH_2Y, CH_2OH or $CH_2OC(R^1)_3$ wherein R^1 is alkyl;

a is an integer from 0 to 2 inclusive; and

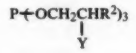
b is an integer from 1 to 3 inclusive, with the proviso that the sum of a and b equal 3, and with the further proviso that at least one R is CH_2OH or $CH_2OC(R^1)_3$.

12. A process for the preparation of ((2-halo-3-t-alkoxypropyl)phosphono)-s-triazines comprising contacting a triazine corresponding to the formula

IV



with a phosphite corresponding to the formula



at a temperature such that a ((3-t-alkoxypropyl)phosphono)-s-triazine corresponding to the formula

II

is prepared wherein:

X is separately in each occurrence chlorine, bromine or alkyl;

Y is separately in each occurrence-chlorine, bromine or haloalkyl;

R^2 is separately in each occurrence hydrogen, hydrocarbyl, CH_2Y or $CH_2OC(R^1)_3$ with the proviso that at least one R^2 is $CH_2OC(R^1)_3$ wherein R^1 is alkyl;

a is an integer from 0 to 2 inclusive; and

b is an integer from 1 to 3 inclusive, with the proviso that the sum of a and b is equal to 3.

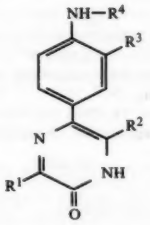
4,556,711

5-(4-AMINO OR ACYLAMINOPHENYL)-2(1H)-PYRAZINONES HAVING INOTROPIC ACTIVITY

John C. Emmett, Welwyn; Robert A. Slater, Letchworth, and Brian H. Warrington, Welwyn Garden, all of England, assignors to Smith Kline & French Laboratories Ltd., Philadelphia, Pa.

Filed Jun. 2, 1983, Ser. No. 500,486
Claims priority, application United Kingdom, Jun. 5, 1982, 8216437; Jun. 8, 1983, 8300476
Int. Cl.[4] C07D 241/18, 403/12, 413/12, 401/12
U.S. Cl. 544—357 **10 Claims**

1. A compound of the formula (I):



or a pharmaceutically acceptable salt thereof, wherein R^1, R^2 and R^3 are independently hydrogen or C_{1-4} alkyl, and R^4 is hydrogen; or R^4 is a C_{1-6} alkoxycarbonyl group optionally substituted by amino, hydroxy, C_{1-4} alkoxy or carboxy (wherein the substituent is not on the carbon atom adjacent to the —CO—O— moiety); or R^4 is a group $—CO—(NR^5)_n-R^6$ wherein n is zero or one, R^6 is hydrogen; or R^6 is optionally substituted C_{1-6} alkyl wherein the optional substituent is up to three groups or atoms selected from carboxy, chloro, bromo, fluoro, amino, hydroxy, C_{1-4} alkoxy, C_{1-6} alkanoylamino, phenyl and phenyl substituted with amino, chloro, fluoro, bromo or C_{1-4} alkyl; or R^6 is optionally substituted phenyl wherein the optional substitutent is amino, chloro, fluoro, bromo, C_{1-4} alkyl or C_{1-4} alkoxy; or R^6 is optionally substituted pyridyl wherein the optional substituent is amino, hydroxy, C_{1-4} alkyl or C_{1-4} alkoxy, and R_5 is hydrogen or C_{1-6} alkyl or R^5 and R^6 form together with the nitrogen atom to which they are attached a piperidine, morpholino, piperazine or N-(C_{1-6}) alkylpiperazine ring; with the exception of 5-(4-aminophenyl)-2-(1H)-pyrazinone.

4,556,712

PREPARATION AND RACEMIZATION OF CHIRAL 1-BENZYL-1,2,3,4-TETRAHYDROISOQUINOLINES

Kenner C. Rice, Rockville, Md., assignor to The United States of America as represented by the Secretary of the Department of Health and Human Services, Washington, D.C.

Continuation-in-part of Ser. No. 265,469, May 20, 1981, which is a continuation-in-part of Ser. No. 165,690, Jul. 3, 1980, abandoned. This application Mar. 18, 1983, Ser. No. 476,830

Int. Cl.[4] C07D *217/20*

U.S. Cl. 546—149 **10 Claims**

1. A method for the optical resolution of lower alkoxy 1-benzyl-1,2,3,4-tetrahydroisoquinolines comprising the steps of

(a) forming an insoluble (−)-isoquinoline base salt with an optically active acid selected from the group consisting of enantiomers of tartaric and malic with alkanol as a solvent and which is capable of regeneration to the (−)-isoquinoline base, and

(b) utilizing the soluble salt to regenerate (+)-isoquinoline base which is reacted with an acid selected from the group consisting of enantiomers of tartaric and malic with alkanol as a solvent to form an insoluble salt which is capable of regeneration to the (+)-isoquinoline base.

4,556,713

6-FLUORO-5-NITROQUINALDINE

Richard M. Stern, Cottage Grove, Minn., assignor to Riker Laboratories, Inc., St. Paul, Minn.

Division of Ser. No. 318,927, Nov. 6, 1981, Pat. No. 4,524,148. This application Nov. 15, 1984, Ser. No. 671,606

Int. Cl.[4] C07D *215/18*

U.S. Cl. 546—180 **1 Claim**

1. The compound 6-fluoro-5-nitroquinaldine.

4,556,714

N-(POLYALKYLPIPERIDINYL)-CARBAMATES OF POLYOLS

Friedrich Karrer, Zofingen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

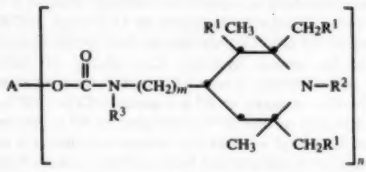
Filed Jan. 16, 1984, Ser. No. 571,060

Claims priority, application Switzerland, Jan. 24, 1983, 383/83

Int. Cl.[4] C07D *211/34, 211/58*

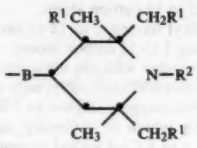
U.S. Cl. 546—190 **12 Claims**

1. A compound of the formula



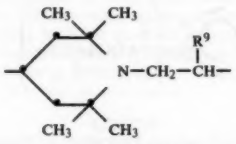
I

in which m is zero, 1 or 2 and n is 2, 3 or 4, R^1 is hydrogen or C_1–C_4-alkyl, R^2 is hydrogen, C_1–C_{12}-alkyl, C_3–C_6-alkenyl, C_3–C_5-alkinyl, C_7–C_{12}-aralkyl, glycidyl, cyanomethyl or one of the groups —CO—NH—R^4, —CO—$N(R^5)_2$, —$COOR^6$, —CH_2COOR^6, —$CH_2CON(R^5)_2$, —CO—R^7 or —$CH_2CH(R^8)OR^9$, R^3 is hydrogen, C_1–C_{20}-alkyl or C_1–C_6-alkyl, C_3–C_5-alkenyl, C_5–C_8-cycloalkyl, C_6–C_{12}-cycloalkylalkyl, C_6–C_{10}-aryl, C_7–C_{15}-alkylaryl or C_7–C_{12}-aralkyl which is substituted by —OR^{10}, —OOC—R^{11}, —CN, —$COOR^{12}$, —$N(R^{13})(R^{14})$ or —$CON(R^{13})(R^{14})$, or is a group of the formula II



II

in which B is a direct bond, —CH_2CH_2— or —CH_2CH_2O —, R^4 is C_1–C_8-alkyl, C_5–C_8-cycloalkyl, C_6–C_{10}-aryl or C_7–C_{15}-alkylaryl, R^5 is C_1–C_8-alkyl, cycloalkyl, phenyl or benzyl, or the two radicals R^5, together with the N atom to which they are attached, form a 5-membered to 7-membered heterocyclic ring, R^6 is C_1–C_{12}-alkyl, C_5–C_8-cycloalkyl, allyl, benzyl or phenyl, R^7 is hydrogen, C_1–C_{11}-alkyl, C_2–C_5-alkenyl, C_5–C_8-cycloalkyl, phenyl or C_7–C_{12}-aralkyl, R^8 is hydrogen, methyl, ethyl, phenyl, butoxymethyl or phenoxymethyl, R^9 is hydrogen, C_1–C_8-alkyl, C_3–C_6-alkenyl, benzyl or —CO—R^{11}, R^{10} is hydrogen, C_1–C_{12}-alkyl or C_5–C_8-cycloalkyl, R^{11} is C_1–C_{11}-alkyl, C_2–C_5-alkenyl, C_5–C_8-cycloalkyl, phenyl, C_7–C_{12}-aralkyl or phenyl or C_7–C_9-phenylalkyl which is substituted by C_1–C_4-alkyl and/or OH, or is a group —NH—R^4, R^{12} is C_1–C_{12}-alkyl, C_5–C_8-cycloalkyl, allyl, benzyl, C_7–C_9-phenylalkyl which is substituted in the phenyl radical by OH and C_1–C_4-alkyl, or phenyl or is a group of the formula II, R^{13} is C_1–C_8-alkyl, cyclohexyl, benzyl, phenyl or a radical of the formula II, and R^{14} is hydrogen, C_1–C_8-alkyl, cyclohexyl or a radical of the formula II, or R^{14}, together with R^{13} and the N atom, forms a 5-membered to 7-membered heterocyclic radical, and A is the n-valent radical of a polyol and, if n is 2, is C_2–C_{16}-alkylene or is C_4–C_{20}-alkylene, C_4–C_{10}-alkenylene, C_6–C_8-cycloalkylene, C_8–C_{12}-dialkylenecycloalkane, C_8–C_{14}-dialkylenearene, C_6–C_{12}-arylene or C_{13}–C_{18}-diphenylenealkane which is interrupted by one or more —O— or —N(C_1–C_4-alkyl)- groups, or is a group of the formula III



III

and, if n is 3, A is a trivalent aliphatic or cycloaliphatic hydrocarbon radical having 3–20 C atoms and, if n is 4, is a tetravalent aliphatic hydrocarbon radical having 4–20 C atoms, and to acid addition salts of these compounds.

4,556,715

NICOTINIC ACID DERIVATIVES

Tsutomu Irikura, Tokyo; Seigo Suzue, Kuki, and Kodo Okada, Yono, all of Japan, assignors to Kyorin Pharmaceutical Co., Ltd., Tokyo, Japan

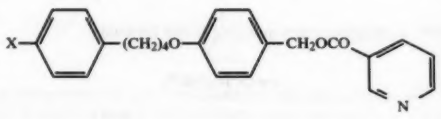
Continuation of Ser. No. 327,201, Dec. 3, 1981, abandoned. This application Oct. 24, 1983, Ser. No. 544,897

Claims priority, application Japan, Dec. 19, 1980, 55-180751

Int. Cl.[4] C07D *213/80*

U.S. Cl. 546—322 **2 Claims**

1. 4-(4-(4-Halophenyl)butoxy)benzyl nicotinates having the formula:



wherein X is chlorine or fluorine, and the pharmaceutically acceptable acid addition salts thereof.

4,556,716

PROCESS FOR THE PRODUCTION OF 2-HALOPYRIDINE DERIVATIVES

Daniel Quarroz, Visp, Switzerland, assignor to Lonza Ltd., Gampel/Valais, Switzerland

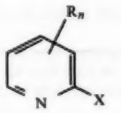
Filed Jan. 11, 1983, Ser. No. 457,268

Claims priority, application Switzerland, Jan. 14, 1982, 194/82

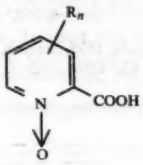
Int. Cl.⁴ C07D *213/26, 213/55*

U.S. Cl. 546—345 **28 Claims**

1. Process for the production of a 2-halopyridine derivative having the formula:



wherein X is halogen, R is —COOH or a lower alkyl radical, and n is 0 to 4, comprising (a) reacting (i) the corresponding 2-pyridine carboxylic acid-N-oxide derivative having the formula:



in the presence of (ii) an excess of at least one anhydride of a lower carboxylic acid having 1 to 4 carbon atoms, (iii) an excess of a trialkylamine each of said alkyl groups of said trialkylamine having 1 to 4 carbon atoms, and (iv) an excess of a halogen-producing compound having the formula CH_tX_m, wherein t is 1 or 2, m is 2 or 3 and X is a halogen selected from the group consisting of Cl, Br and I, or having the formula $C_2H_pX_m$, wherein p is 3 or 4, m is 2 or 3 and X is a halogen selected from the group consisting of Cl, Br and I, and in the liquid phase, (b) adjusting the reaction mixture in the liquid to a pH value of 12 to 13 and (c) isolating the resultant product from this mixture.

4,556,717

PROCESS FOR PRODUCING 1-[2-(2,4-DICHLOROPHENYL)-PENTYL]-1H-1,2,4-TRIAZOLE

Hansjürg Wetter, Therwil; Peter Baumeister, Flüh; Paul Radimerski, Arisdorf, and Pierre Martin, Rheinfelden, all of Switzerland, assignors to Ciba Geigy Corporation, Ardsley, N.Y.

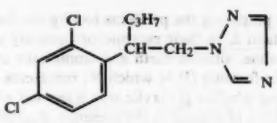
Filed Jun. 16, 1983, Ser. No. 505,019

Claims priority, application Switzerland, Jun. 18, 1982, 3773/82

Int. Cl.⁴ C07D *249/08*

U.S. Cl. 548—262 **9 Claims**

1. A process for producing 1-[2-(2,4-dichlorophenyl)-pentyl]-1H-1,2,4-triazole of the formula

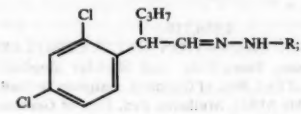


(I)

which process comprises reacting 2-(2,4-dichlorophenyl)-valeronitrile, in the presence of hydrogen, an acid and a hydrogenation catalyst, with a compound of the formula II

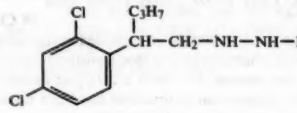
$$H_2N—NH—R \quad \text{(II)}$$

to give a compound of the formula III



(III)

hydrogenating the compound of the formula III catalytically to a compound of the formula IV



(IV)

and subsequently either (a) hydrolysing a compound of the formula IV wherein R is not hydrogen, and converting the compound of the formula IV wherein R = H, or a salt thereof with an inorganic or organic acid, with formamide, and/or with (3-(dimethylamino)-2-azaprop-2-en-1-ylidene)-dimethylammonium chloride, into the compound of the formula I or (b) converting a compound of the formula IV wherein R is —COR′, with aqueous formic acid, into an N,N′-bisformyl derivative, and reacting this with formamide, optionally in the presence of NH_3 or of a substance releasing NH_3, into a compound of the formula I; where R is —CHO, —COR′ or —COOR′, and R′ is methyl or ethyl.

4,556,718

4,5-DIALKOXY-1,3-DIOXOLANE-2-CARBOXYLIC ACIDS, THEIR DERIVATIVES, PREPARATION PROCESS AND APPLICATION

Francine Chastrette; Corinne Bracoud, and Maurice Chastrette, all of Caluire, France, assignors to Societe Francaise Hoechst, Puteaux, France

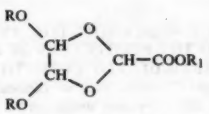
Filed Nov. 6, 1984, Ser. No. 668,854

Claims priority, application France, Nov. 18, 1983, 83 18374

Int. Cl.⁴ C07D *317/00*

U.S. Cl. 549—449 **8 Claims**

1. The products having the general formula (I):



(I)

in which R represents an alkyl radical containing from 1 to 4 carbon atoms, and R_1 is selected from the group comprising a hydrogen atom, and alkyl radicals containing from 1 to 4 carbon atoms, in their racemic and optically active forms, as well as the alkaline, alkaline-earth and amine salts, products

having the general formula (I) in which R_1 represents a hydrogen atom.

8. A process for preparing the products having the formula (I) according to claim 1, in their racemic or optically active forms, and the alkaline, alkaline-earth and amine salts of said products having the formula (I) in which R_1 represents a hydrogen atom, process wherein glyoxylic acid is reacted with an equimolecular quantity of glyoxal in the presence of an alkanol having the formula ROH in which R represents a C_1–C_4-alkyl radical to obtain a product having the formula (I) in which R and R_1, being identical, both represent a C_1–C_4-alkyl radical, said reaction being followed by a step of saponification at alkaline pH to obtain a product having the formula (I) in which R represents C_1–C_4 alkyl radical and R_1 represents a hydrogen atom, further comprising a step of salification or esterification in neutral or alkaline medium.

4,556,719

PRODUCTION OF TRANSITION METAL COMPLEXES

Helmut Bönnemann, Essen-Ruhr, and Borislav Bogdanovic, Mülheim, both of Fed. Rep. of Germany, assignors to Studiengesellschaft Kohle MBH, Mulheim, Fed. Rep. of Germany

Division of Ser. No. 466,813, Feb. 16, 1983, Pat. No. 4,469,638. This application Apr. 25, 1984, Ser. No. 603,536

Claims priority, application Fed. Rep. of Germany, Feb. 17, 1982, 3205550

Int. Cl.[4] C07F *15/04, 15/06, 15/00, 7/28*

U.S. Cl. 556—13 **24 Claims**

1. A process for the production of complex compounds of the transition metals, characterized in that transition metal salts are reacted with magnesium, to which a catalytic quantity of anthracene and/or magnesium anthracene has been added as activator, in the presence of complexing ligands.

4,556,720

FLUOROCHEMICAL RHODIUM COMPOUNDS

Allen R. Siedle, and Richard D. Howells, both of St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Oct. 12, 1983, Ser. No. 541,129

Int. Cl.[4] C07F *15/00*

U.S. Cl. 556—22 **9 Claims**

1. A coordination compound having the formula:

$[(aryl)_3P]_3Rh^+(counterion)^-$ or

$[(aryl)_3P]_3Rh(CO)_n^+(counterion)^-$

wherein

aryl is phenyl, phenyl substituted by 1 to 3 methyl groups, or for one aryl group, polystyryl,

n is the integer 1 or 2,

$(counterion)^-$ is the conjugate base of acids selected from $HC(R)(SO_2R_f)_2$, R_fSO_3H, and $HN(SO_2R_f)_2$

wherein

R_f is a perfluoroalkyl group having 1 to 20 carbon atoms,

R_f' is a perfluoroalkyl group having 4 to 20 carbon atoms, and

R is lower alkyl, phenyl, Cl, H, SO_2R_f, or R_f.

4,556,721

DERIVATIVES OF MERCUROBUTOL, AND THEIR APPLICATION TO THE PROTECTION OF SUPPORTS MORE PARTICULARLY IN TEXTILES

Daniel Wattiez; Roger Chatelin, both of Lissieu, and Michel Bourgeois, Lyons, all of France, assignors to Centre Technique Industriel Styled: Institut Textile, France

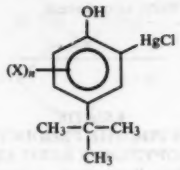
Filed Jan. 13, 1984, Ser. No. 570,596

Claims priority, application France, Jan. 13, 1983, 83 00442

Int. Cl.[4] C07F *3/12*

U.S. Cl. 556—128 **5 Claims**

1. A mercurobutol derivatives of the formula:



wherein n is 1 or 2 and x is a fucntional group selected from the group consisting of allyl, vinyl, acryl, and epoxy, said functional group being capable of participating in a polymerization or polyaddition reaction, and said derivatives having the bioactive properties of mercurobutol after said polymerization or polyaddition reaction.

4,556,722

PROCESS FOR THE PREPARATION OF AMINOPROPYLALKOXYSILANES

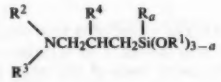
Jennifer M. Quirk, Bedford Hills, N.Y., and Scot Turner, Marietta, Ohio, assignors to Union Carbide Corporation, Danbury, Conn.

Filed Mar. 28, 1985, Ser. No. 717,036

Int. Cl.[4] C07F *7/08, 7/10*

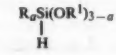
U.S. Cl. 556—413 **29 Claims**

1. A process for preparing an aminopropylalkoxysilane having the formula



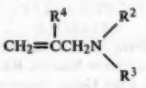
wherein R and R^1 individually are C_1–C_6 alkyl; R^2 and R^3 individually are hydrogen, C_1–C_{10} alkyl, C_1–C_{10} alkenyl, $-CH_2CH_2NHCH_2CH_2NH_2$, $-CH_2CH_2NH_2$, phenyl or substituted phenyl; R^4 is hydrogen or C_1–C_6 alkyl; and a is 0, 1 or 2, which process comprises reacting:

a. a silane having the formula



wherein R, R^1 and a are as defined above;

b. with an amine having the following formula:



wherein R^2, R^3 and R^4 are as defined above;

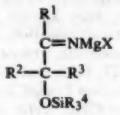
c. in the presence of a catalytic amount of a rhodium-triorganophosphorus-complex catalyst comprising rhodium in a complex combination with a triorganophosphorus ligand wherein each organo moiety contains from 1 to 18 carbon atoms, to produce the aminopropylalkoxysilane.

4,556,723
PROCESS FOR THE PRODUCTION OF ACYLOINS

Steven M. Heilmann, North St. Paul; Larry R. Krepski, White Bear Lake, and Jerald K. Rasmussen, Stillwater, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 468,719, Feb. 22, 1983. This application Mar. 15, 1985, Ser. No. 712,228
Int. Cl.[4] C07F *7/08, 7/10, 7/18*
U.S. Cl. 556—413 1 Claim

1. A product represented by the formula



wherein

R^1 is an alkyl radical, an aralkyl radical, or an aryl radical, and

R^2 and R^3 are independently hydrogen, an alkyl radical, an aralkyl radical, or an aryl radical,

R^4 is an alkyl radical, an aralykyl radical, or an aryl radical, and

X is chloro, bromo, or iodo.

4,556,724
METHOD FOR THE PREPARATION OF MERCAPTO ALKYL SILANES

Claus-Dietrich Seiler, Rheinfelden, and Hans-Joachim Vahlensieck, Wehr, both of Fed. Rep. of Germany, assignors to Dynamit Nobel AG, Troisdorf, Fed. Rep. of Germany

Filed Dec. 19, 1984, Ser. No. 683,386
Claims priority, application Fed. Rep. of Germany, Dec. 24, 1983, 3346910
Int. Cl.[4] C07F *7/08, 7/18*
U.S. Cl. 556—429 12 Claims

1. In a method for the preparation of mercaptoalkylsilanes by the reaction of halogen alkyl silanes with thiourea and ammonia and separation of the resulting guanidine hydrohalide, the improvement comprising the steps of, after the reaction of halogen alkyl silanes with thiourea and ammonia and before separating the guanidine hydrohalide, treating the reaction mixture with a chlorinated hydrocarbon.

4,556,725
PROCESS FOR PREPARING TRIACETOXYSILANES FROM TRIS(AMINO)SILANES

Bernard Kanner, West Nyack; Jennifer M. Quirk, Bedford Hills; Arthur P. De Monte, Brooklyn, and Steven P. Hopper, Mahopac, all of N.Y., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Jan. 24, 1985, Ser. No. 694,307
Int. Cl.[4] C07F *7/08, 7/18*
U.S. Cl. 556—442 11 Claims

1. Process for preparing triacetoxysilanes comprising:

(a) adding a tris(amino)silane of the general formula[I]:

$$R'Si(NRR'')_3 \qquad [I]$$

wherein R is a saturated or unsaturated aliphatic hydrocarbon radical or an aromatic hydrocarbon radical and R' and R'' are the same or different and each is hydrogen, a saturated or unsaturated aliphatic hydrocarbon radical, or an aromatic hydrocarbon radical to acetic anhydride to form a reaction mixture; and

(b) maintaining the reaction mixture at a reaction temperature no greater than about 50° C. to form a triacetoxysilane of the general formula [II]:

$$R'Si(OC(O)CH_3)_3 \qquad [II]$$

wherein R' is as before.

4,556,726
PROCESS FOR CONVERTING OCTAMETHYLCYCLOTETRASILOXANE TO DECAMETHYLCYCLOPENTASILOXANE

James D. Reedy, and John J. Walsh, both of Marietta, Ohio, assignors to Union Carbide Corporation, Danbury, Conn.

Filed Jan. 9, 1985, Ser. No. 689,991
Int. Cl.[4] C07F *7/08*
U.S. Cl. 556—460 14 Claims

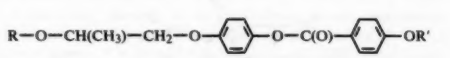
1. A process for preparing decamethylcyclopentasiloxane from octamethylcyclotetrasiloxane by heating the latter with aqueous hydrochloric acid and a salt of a protonated amine having at least one nitrogen-bonded monovalent hydrocarbon group having 5 to 14 carbon atoms at a temperature in excess of 60° C.

4,556,727
FERROELECTRIC SMECTIC LIQUID CRYSTALS

David M. Walba, Boulder, Colo., assignor to University Patents, Inc., Westport, Conn.

Filed Jul. 18, 1984, Ser. No. 632,140
Int. Cl.[4] C09K *3/34;* G02F *1/13;* C07C *69/773, 69/78*
U.S. Cl. 560—73 16 Claims

1. A compound of the formula:



wherein R is a lower alkyl of one to three carbon atoms, and R' is an alkyl of nine to twelve carbon atoms.

4,556,728
SEPARATION OF METHANOL FROM MIXTURES CONTAINING IT

David Farrar, and Gerald P. Benn, both of West Yorkshire, England, assignors to Allied Colloids Limited, England

Filed Nov. 28, 1984, Ser. No. 675,501
Claims priority, application United Kingdom, Nov. 28, 1983, 8331707
Int. Cl.[4] C07C *67/03, 29/92, 31/04*
U.S. Cl. 560—217 11 Claims

1. A method of separating methanol from a substantially anhydrous mixture with an organic compound with which it forms an azeotrope, characterised in that the method comprises dissolving into the mixture an inorganic salt that forms a complex with methanol thereby forming a homogeneous mixture comprising the organic compound and the complex, adding an organic solvent that is miscible with the organic compound and immiscible with the complex and thereby forming a heterogeneous mixture, and separating the phases.

11. A method according to claim 1 in which, in a first circuit, methyl (meth)acrylate is reacted with an alcohol in the presence of excess methyl (meth)acrylate and a transesterification catalyst to form a mixture of a higher boiling ester, methyl (meth)acrylate and methanol, a mixture of methyl (meth)acrylate and methanol is separated from this mixture, in a second circuit the inorganic salt is added to this mixture to form the homogeneous mixture, the organic solvent is added to form the heterogeneous mixture and the phases are separated, methyl (meth)acrylate is recovered from one phase and is recycled to the first circuit and, within the second circuit, the organic solvent and the salt are recovered and recycled.

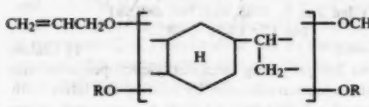
4,556,729

DIACRYLATE AND METHOD FOR MANUFACTURING THE SAME

Motonobu Kubo, and Kazumi Honda, both of Iwakuni, Japan, assignors to Sanyo-Kokusaku Pulp Co., Ltd., Tokyo, Japan

Filed Jul. 9, 1984, Ser. No. 628,865
Claims priority, application Japan, Dec. 7, 1983, 58-232112
Int. Cl.⁴ C07C *69/54*
U.S. Cl. 560—220 **3 Claims**

1. A diacrylate derivative represented by the formula (I)



(I)

wherein R denotes acryloyl or methacryloyl group.

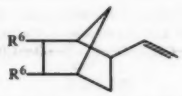
4,556,730

ESTER COMPOUNDS FROM 5-VINYL-2-NORBORNENE

John R. Sanderson; Edward C. Y. Nieh, and Lewis W. Watts, Jr., all of Austin, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Sep. 24, 1982, Ser. No. 423,413
Int. Cl.⁴ C07C *69/16, 69/28*
U.S. Cl. 560—256 **1 Claim**

1. Ester compounds having the formula



where R^6 is

and R^1 is a lower alkyl group having 1 to 4 carbon atoms.

4,556,731

PROCESS FOR THE OXIDATION OF OLEFINS USING CATALYSTS CONTAINING VARIOUS PROMOTER ELEMENTS

Andrew T. Guttmann, Maple Heights, and Robert K. Grasselli, Chagrin Falls, both of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Continuation of Ser. No. 148,120, May 9, 1980, abandoned, which is a continuation of Ser. No. 819,733, Jul. 9, 1977, abandoned. This application Apr. 19, 1982, Ser. No. 369,371
Int. Cl.⁴ C07C *45/35, 47/22, 51/25, 57/05*
U.S. Cl. 562—546 **2 Claims**

1. In a process for the preparation of unsaturated aldehydes and acids from propylene or isobutylene by the vapor phase oxidation of propylene or isobutylene with molecular oxygen at a temperature of about 200° C. to 600° C. in the presence of a catalyst, the improvement comprising using as the catalyst a catalyst of the formula

$$A_aB_bFe_cBi_dM_eMo_{12}O_x$$

wherein

A is alkali metal, thallium, silver or mixtures thereof,

B is Ni and/or Co, and

M is Ge+W, and further

wherein

$0 \leqq a \leqq 0.5$, $0.1 \leqq b \leqq 20$, $0.1 \leqq c \leqq 20$, $0.1 \leqq d \leqq 20$ and $0.01 \leqq e \leqq 6$, and

x is a number such that the valence requirements for the other elements for oxygen are satisfied,

and wherein the minimum amount of each element in M is 1 atom percent based on the number of atoms in component M.

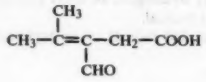
4,556,732

PENTENOIC ACID AND ITS PREPARATION

Jacques Martel, Bondy; Jean Tessier, Vincennes, and Jean-Pierre Demoute, Montreuil-sous-Bois, all of France, assignors to Roussel Uclaf, Romainville, France

Filed May 27, 1980, Ser. No. 153,338
Claims priority, application France, Jun. 6, 1979, 79 14425
Int. Cl.⁴ C07C *51/09, 59/74*
U.S. Cl. 562—577 **9 Claims**

1. The 3-formyl-4-methyl-pent-3-ene-1-oic acid of the formula



(I)

4,556,733

PROCESS FOR THE PREPARATION OF 2-HYDROXYBENZENESULFONAMIDE

Thomas A. Sullivan, and Vincent G. Witterholt, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jun. 11, 1984, Ser. No. 619,275
Int. Cl.⁴ C07C *143/78*
U.S. Cl. 564—89 **15 Claims**

1. A process comprising (1) contacting 2,4-dichlorophenol with at least 4 equivalents of chlorosulfonic acid and 0–2 equivalents of thionyl chloride, quenching the reaction product in water at 0°–60° C. to form 2-hydroxy-3,5-dichlorobenzenesulfonyl chloride, and optionally adding a chlorocarbon solvent, (2) contacting the sulfonyl chloride from (1) with at least 3 equivalents of aqueous ammonia or anhydrous ammonia at −5° to 25° C. to form 2-hydroxy-3,5-dichlorobenzenesulfonamide and (3) dehalogenating the sulfonamide by contacting the reaction product from (2) with hydrogen, in a solvent, in the presence of at least two equivalents of a base and a catalyst at a pressure of at least one atmosphere.

4,556,734

PROCESS FOR SYNTHESIZING FORMAMIDES FROM SYNTHESIS GAS PLUS AMMONIA

John F. Knifton, Austin, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed Nov. 4, 1983, Ser. No. 548,900
Int. Cl.⁴ C07C *102/00*
U.S. Cl. 564—132 **13 Claims**

1. A process for synthesizing formamide, N,N-dimethylformamide and N-methylformamide, which comprises contacting a mixture of carbon monoxide, hydrogen and ammonia at a pressure of 500 psi or greater and at a temperature of 100° C. or greater with a catalyst system comprising a mixture of a ruthemium-containing compound and a quaternary phosphonium salt.

4,556,735

SPERGUALIN-RELATED COMPOUNDS HAVING A PHENYLENE GROUP AS WELL AS A PROCESS FOR PRODUCING THE SAME

Hamao Umezawa; Tomio Takeuchi; Rinzo Nishizawa; Katsutoshi Takahashi, all of Tokyo; Teruya Nakamura, Kusatsu, and Yoshihisa Umeda, Otsu, all of Japan, assignors to Zaidan Hojin Biseibutsu Kagaku Kenkyukai, Tokyo, Japan

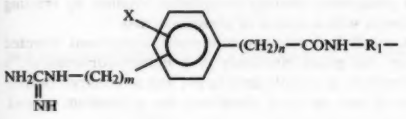
Filed Feb. 27, 1985, Ser. No. 706,312

Claims priority, application Japan, Mar. 2, 1984, 59-38615

Int. Cl.[4] C07C *103/28*

U.S. Cl. 564—157 5 Claims

1. A Spergualin-related compound having a phenylene group, which is represented by the formula



$$-CONH(CH_2)_4NH(CH_2)_3NH_2$$

(wherein R_1 is a lower alkylene group which may be substituted by a hydroxymethyl group; X is a hydrogen atom or a halogen atom; m and n are each 0 or an integer of 1 to 5) and a salt thereof.

4,556,736

METHOD FOR PRODUCING CRYSTALLINE ACRYLAMIDO ALKYL TRIALKYLAMMONIUM CHLORIDES

Heiko Humbert, Hamburg, and Karlheinz Laping, Moers, both of Fed. Rep. of Germany, assignors to Deutsch Texaco Aktiengesellschaft, Hamburg, Fed. Rep. of Germany

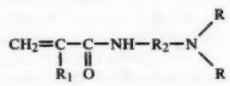
Filed Jul. 30, 1984, Ser. No. 635,685

Claims priority, application Fed. Rep. of Germany, Aug. 23, 1985, 3330326

Int. Cl.[4] C07C *85/00, 85/26*

U.S. Cl. 564—204 8 Claims

1. A process for producing a crystalline acrylamidoalkyltrialkylammohium chloride which comprises reacting a substituted acrylamide with alkyl chloride having 1 to 3 carbon atoms in the presence of a reaction medium selected from the group consisting of acetone, methyl tert. butyl ether and cyclohexane, said substituted acrylamide being represented by the formula:



in which R is an alkyl radical having from 1 to 3 carbon atoms, R_1 is hydrogen or a methyl radical and R2 is a divalent alkylene radical having from 2 to 5 carbon atoms

4,556,737

SULFONIUM COMPOUNDS, PROCESSES FOR PREPARING THE COMPOUNDS AND PHARMACOLOGICAL COMPOSIITONS CONTAINING THE SAME

Akihide Koda; Mikio Hori; Naosuke Matsuura, all of Gifu; Mitsugi Yasumoto, Tokushima; Ichiro Yamawaki, Tokushima; Shuichi Ueda, Tokushima, and Yukio Tada, Tokushima, all of Japan, assignors to Taiho Pharmaceutical Company Limited, Tokyo, Japan

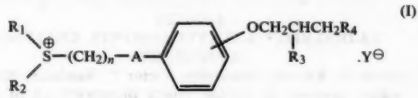
Filed Feb. 27, 1984, Ser. No. 583,674

Claims priority, application Japan, Mar. 11, 1983, 58-41184; Mar. 16, 1983, 58-44777; Jan. 18, 1984, 59-7731

Int. Cl.[4] C07C *103/12, 148/00, 43/20, 41/18*

U.S. Cl. 564—218 9 Claims

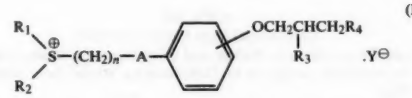
1.



(I)

wherein R_1 and R_2 are the same or different and are each alkyl having 1 to 6 carbon atoms; R_3 is hydrogen, hydroxy, alkoxy having 1 to 6 carbon atoms, phenylalkyloxy having 7 to 10 carbon atoms, or phenylalkyloxymethoxy having 8 to 11 carbon atoms; R_4 is hydrogen, hydroxy, alkoxy having 1 to 6 carbon atoms, acyloxy having 2 to 6 carbon atoms, cycloalkyloxy having 5 to 7 carbon atoms, phenoxy, benzoyloxy, alkoxycarbonyloxy having 2 to 5 carbon atoms, ethoxy substituted with alkoxy having 1 to 6 carbon atoms, carbamoyloxy, alkylcarbamoyloxy having 2 to 5 carbon atoms, phenylcarbamoyloxy or phenylalkyloxycarbonyloxy having 8 to 11 carbon atoms; Y is an acid residue; A is —CONH— and n is an integer of 1 to 3; with the proviso that R_3 and R_4 are not both hydrogen at the same time and that when R_3 is hydroxy, R_4 is not acyloxy having 2 to 6 carbon atoms.

9. An anti-allergic composition comprising as an active component a sulfonium compound represented by the formula



(I)

wherein R_1, R_2, R_3, R_4, n, A and Y are as defined in claim 1 in admixture with a pharmaceutically acceptable, non-toxic carrier or excipient.

4,556,738

PROCESS FOR PREPARATION OF 3,3'- OR 3,4'-DIAMINO BENZOPHENONE

Saburo Kawashima, Yokosuka, and Akihiro Yamaguchi, Kamakura, both of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

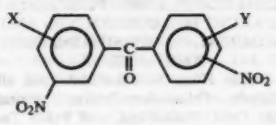
Filed Jan. 3, 1983, Ser. No. 454,973

Claims priority, application Japan, Jan. 12, 1982, 57-2255; Jan. 25, 1982, 57-8829; Mar. 24, 1982, 57-45691; Apr. 13, 1982, 57-60273; May 21, 1982, 57-84890; Jul. 17, 1982, 57-123775

Int. Cl.[4] C07C *97/10*

U.S. Cl. 564—329 7 Claims

1. A process for preparing 3,3'- or 3,4'-diamino benzophenone which comprises catalytically reducing and dehalogenating, in the presence of a reduction catalyst and a dehydrohalogenation agent, a benzophenone compound or benzophenone compounds of the following general formula



(I)

in which X is a halogen atom at position 2 or 4 of the benzene ring and Y is hydrogen or a halogen atom and in which the nitro group is at position 3' or 4' of the benzene ring if Y is hydrogen, while Y is at position 4' and the nitro group is at position 3' if Y is a halogen atom.

4,556,739

3,4-DIALKOXY-2-ALKYLCARBONYL ANALINO COMPOUNDS

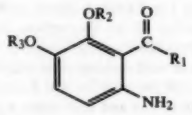
Ramesh M. Kanojia, Somerville; Victor T. Bandurco, Bridgewater; Seymour D. Levine, North Brunswick, all of N.J.; Dennis M. Mulvey, New Hope, and Alfonso J. Tobia, Doylestown, both of Pa., assignors to Ortho Pharmaceutical Corporation, Raritan, N.J.

Continuation-in-part of Ser. No. 537,232, Sep. 29, 1983. This application Jul. 2, 1984, Ser. No. 627,139

Int. Cl.[4] C07C *87/52*

U.S. Cl. 564—443 **2 Claims**

1. A compound of the formula



wherein R_1, R_2 and R_3 are the same or different lower alkyl.

4,556,740

PHOSPHORUS COMPOUNDS

Hans-Jürgen Hansen, Riehen, and Rudolf Schmid, Basle, both of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

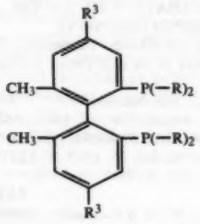
Filed Aug. 19, 1983, Ser. No. 524,714

Claims priority, application Switzerland, Aug. 27, 1982, 5109/82; Jul. 1, 1983, 3641/83

Int. Cl.[4] C07F *9/50, 9/52*

U.S. Cl. 568—13 **4 Claims**

1. Chiral phosphorus compounds of either the (R)- or the (S)-form, of the formula



I

wherein R is phenyl or phenyl substituted with lower alkyl, lower alkoxy, di-lower alkylamino or fluorine, and R^3 is di-lower alkylamino.

4,556,741

DISMUTATION OF FUNCTIONALIZED OLEFINS

Malcolm J. Lawrenson, Swanland, England, assignor to BP Chemicals Limited, London, England

Filed Nov. 28, 1983, Ser. No. 555,390

Claims priority, application United Kingdom, Dec. 2, 1982, 8234383

Int. Cl.[4] C07C *45/45*

U.S. Cl. 568—395 **7 Claims**

1. A process for the catalytic dismutation of a functionalized olefin having a heteroatom which is a non-hydroxylic oxygen atom selected from the group consisting of an ester, ether or a ketone, which process comprises bringing the functionalized olefin into contact with a catalyst which comprises

(a) a rhenium heptoxide component,

(b) a phosphated alumina component obtained by treating alumina with a source of phosphate, and

(c) a metal hydrocarbon compound component selected from the group consisting of a mono-hydrotrialkyl-, a tetroalkyl-, a monohydrotriaryl-, and a tetraaryl- derivative of zinc, mercury, aluminum, tin, germanium or lead.

4,556,742

PROCESS FOR THE PREPARATION OF α,δ-DIETHYLENIC CARBONYL COMPOUNDS

Norbert Bluthé, Villeurbanne; Armand S. Falou, Choiseul, and Jacques Goré, Caluire, all of France, assignors to Rhone-Poulenc Sante, Courbevoie, France

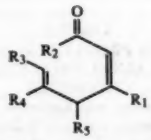
Filed May 25, 1984, Ser. No. 614,218

Claims priority, application France, May 27, 1983, 83 08809

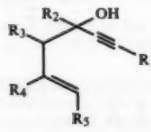
Int. Cl.[4] C07C *45/51*

U.S. Cl. 568—403 **9 Claims**

1. A process for the preparation of an α,δ-diethylenic carbonyl compound of the formula:



in which R_1, R_2, R_3 and R_4, which may be identical or different, each denote a hydrogen atom or a hydrocarbon radical, it being understood that R_2 and R_3 may together form an alkylene radical $(-CH_2-)_n$ in which each of the carbon atoms may be unsubstituted or substituted by one or more alkyl radicals of 1 to 4 carbon atoms each and in which n is an integer from 3 to 20, R_5 is hydrogen, and R_2 and R_5 may together form a ring containing from 6 to 16 chain members, which comprises contacting an acetylenic alcohol of the formula:



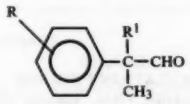
in which R_1, R_2, R_3, R_4 and R_5 are as defined above, at a temperature below 100° C., with a catalyst chosen from the metals of Group Ib of the periodic table.

4,556,743
SELECTIVE DECARBONYLATION PROCESS

James E. McKenna, Millburn, and Thomas Plocek, Warren, both of N.J., assignors to Chem-Fleur International, Inc., Newark, N.J.

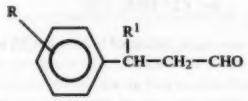
Filed Jul. 2, 1984, Ser. No. 626,548
Int. Cl.[4] C07C *45/78, 45/61*
U.S. Cl. 568—433 8 Claims

1. A process for selectively decarbonylating a compound of the formula



(I)

in a mixture containing I and a compound of the formula



(II)

wherein R represents hydrogen or at least one lower alkyl group and R^1 represents hydrogen or a lower alkyl group, said process comprising the steps of providing such a mixture; treating the mixture with a catalytically effective amount of a Pd catalyst and at a temperature and pressure effective to selectively decarbonylate the compound of formula I therein; and recovering the compound of formula II from the treated mixture.

4,556,744
PROCESS FOR THE PRODUCTION OF ETHANOL AND/OR ACETALDEHYDE BY THE METAL CATALYSED LIQUID PHASE REACTION OF METHANOL, CARBON MONOXIDE AND HYDROGEN IN THE PRESENCE OF A SOLVENT

Colin G. Griggs, Ashford, and Philip G. Lodge, Woking, both of England, assignors to The British Petroleum Company p.l.c., London, England

Filed Oct. 5, 1984, Ser. No. 658,200
Claims priority, application United Kingdom, Oct. 8, 1983, 8326986
Int. Cl.[4] C07C *45/49*
U.S. Cl. 568—487 9 Claims

1. A process for the preparation of acetaldehyde, ethanol or mixtures thereof which process comprises reacting methanol, carbon monoxide and hydrogen at an elevated temperature and pressure in the presence of a cobalt catalyst wherein

(1) in a carbonylation stage the methanol is reacted with the carbon monoxide and hydrogen in the presence of the cobalt catalyst and, as a recycle solvent, sulpholane or a substituted derivative thereof,

(2) in a separation stage the reaction products and unreacted methanol are separated from the cobalt catalyst and the recycle solvent, and

(3) in a recycle stage the catalyst and recycle solvent are recycled to the carbonylation stage.

4,556,745
LIQUID CRYSTAL COMPOUNDS

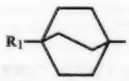
Neil Carr, Hull, and George W. Gray, Cottingham, both of England, assignors to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Continuation of Ser. No. 348,261, Feb. 12, 1982, abandoned.
This application Mar. 26, 1984, Ser. No. 592,757
Claims priority, application United Kingdom, Feb. 13, 1981, 8104527
Int. Cl.[4] C07C *43/20, 69/00, 69/96, 67/02, 121/60, 13/615*
U.S. Cl. 568—632 13 Claims

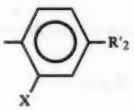
1. A compound suitable for use in liquid crystal material and having the formula:

$$A—CH_2.CH_2—B$$ Formula (I)

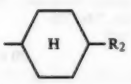
where A and B are substituted ring structures, A being:



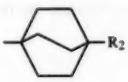
where R_1 is an alkyl group; and B being selected from:



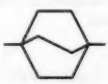
where R'_2 is an alkyl group R_2, an alkoxy group OR_2, an alkylcarbonyloxy group $OCO.R_2$ or an alkoxycarbonyloxy group $OCO.OR_2$; and X is hydrogen or a cyano group or a methyl group or a halogen;



where R_2 is an alkyl group; or



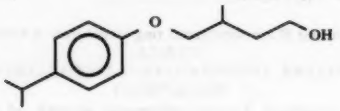
where R_2 is an alkyl group;



being a 1,4-disubstituted bicyclo(2,2,2)octane ring.

4,556,746
4(P-CUMENYLOXY)-3-METHYL-1-BUTANOL
Futoshi Fujioka, Wanamassa; Richard M. Boden, Ocean, and William L. Schreiber, Jackson, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.
Division of Ser. No. 644,059, Aug. 24, 1984, which is a division of Ser. No. 574,150, Jan. 26, 1984, which is a continuation-in-part of Ser. No. 533,915, Sep. 19, 1983, Pat. No. 4,521,634, which is a continuation-in-part of Ser. No. 507,292, Aug. 1, 1983, abandoned. This application Mar. 8, 1985, Ser. No. 709,915
Int. Cl.⁴ C07C *43/205*
U.S. Cl. 568—648 **1 Claim**

1. The ether carbinol having the structure:



4,556,747
FLUORINATED VINYL ETHERS, COPOLYMERS THEREOF, AND PRECURSORS THERETO
Paul R. Resnick, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.
Division of Ser. No. 565,778, Dec. 27, 1983, Pat. No. 4,526,948. This application Mar. 1, 1985, Ser. No. 707,207
Int. Cl.⁴ C07C *43/16, 43/17*
U.S. Cl. 568—674 **3 Claims**

1. A chemical compound having the structural formula

$$CF_2{=}CFO(CF_2\underset{\displaystyle CF_3}{\underset{|}{C}}FO)_nCF_2CF_2CF_2OR$$

wherein n is 0 or 1 and R is CH_3 or C_2H_5.

4,556,748
PROCESS FOR PRODUCING ALKYLENE GLYCOLS
Albert C. Tsang, Baton Rouge, La.; Thomas L. Holland, Charlottesville, Va., and Johnny W. Masey, Baton Rouge, La., assignors to The Dow Chemical Company, Midland, Mich.
Filed Oct. 31, 1983, Ser. No. 546,790
Int. Cl.⁴ C07C *27/02*
U.S. Cl. 568—858 **20 Claims**

1. A process for the production of an alkylene glycol comprising contacting water and an alkylene carbonate under mild conditions at less than about 80 psig in the presence of a catalyst in a reaction zone;
(1) from which evolved CO_2 is readily removed; and
(2) in which the temperature is controlled such that the temperature of the liquid phase increases by at least about 26.4° C. as said liquid phase passes through the reaction zone.

4,556,749
CATALYTIC CONVERSION OF OLEFINS TO HIGHER HYDROCARBONS
Edward A. Hazbun, Media, Pa., assignor to Atlantic Richfield Company, Los Angeles, Calif.
Filed Apr. 16, 1984, Ser. No. 601,144
The portion of the term of this patent subsequent to Feb. 28, 2001, has been disclaimed.
Int. Cl.⁴ C07C *1/00*
U.S. Cl. 585—330 **1 Claim**

1. A process for converting methane to higher hydrocarbon products which comprises:
(a) contacting at a temperature selected within the range of about 500° to 1000° C. a gas comprising methane and at least one reducible oxide of at least one metal which oxides when contacted with methane at said temperature are reduced and produce higher hydrocarbon products and water, said contacting producing an effluent comprising normally gaseous olefins containing a major amount of unreacted methane and other higher, normally gaseous, alkanes; and
(b) oligomerizing said effluent to produce higher hydrocarbon products.

4,556,750
ALKYLATION PROCESS
R. Lynn Cobb, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.
Continuation of Ser. No. 385,248, Jun. 4, 1982, abandoned. This application Apr. 12, 1985, Ser. No. 722,625
Int. Cl.⁴ C07C *2/66*
U.S. Cl. 585—446 **7 Claims**

1. A process for the dialkylation of benzene with isobutylene which comprises:
(a) adding to said benzene and an alkylation catalyst about 10 to about 50 volume percent of the total amount of isobutylene to be used in the alkylation process;
(b) heating the mixture produced in step (a) up to an alkylation reaction temperature; and
(c) adding the remainder of the isobutylene to be used in the alkylation process to said heated mixture to produce ditertiary-butylbenzene.

4,556,751
CATALYTIC ISOMERIZATION PROCESS OF DIMETHYLNAPHTHALENES
Takao Maki, Fujisawa; Tetsuo Masuyama, Machida, and Yoshio Asahi, Sagamihara, all of Japan, assignors to Mitsubishi Chemical Industries Limited, Tokyo, Japan
Filed Feb. 14, 1984, Ser. No. 579,958
Int. Cl.⁴ C07C *5/22, 5/30*
U.S. Cl. 585—481 **8 Claims**

1. A process for catalytically isomerizing dimethylnaphthalene which comprises, using a zeolite having pore windows provided by ten-membered oxygen rings, said zeolite being (1) an acid-type pentasil aluminolsilicate having a silica/alumina molar ratio of 12 of higher and an acid content of 0.1 mmol/g or higher at 300° C. as determined by gaseous base absorption, or said zeolite being (2) an acid-type pentasil iron silicate having a SiO_2/Fe_2O_3 molar ratio of 12 or higher.

4,556,752
PREPARATION OF LIQUID HYDROCARBONS FROM METHANOL
Charles H. Mauldin, and Virgil L. Payne, both of Baton Rouge, La., assignors to Exxon Research and Engineering Co., Florham Park, N.J.
Filed Jun. 29, 1984, Ser. No. 626,026
Int. Cl.⁴ C07C *1/00*
U.S. Cl. 585—640 **14 Claims**

2. A process useful for the conversion of methanol to liquid hydrocarbons which comprises contacting an admixture of methanol and hydrogen, in methanol:hydrogen molar ratio equal to or greater than about 2:1 at a methanol partial pressure of about 100 psia, and higher, over a catalyst which consists essentially of cobalt, or cobalt and thoria in catalytically active amount composited with titania or a titania-containing support.

4,556,753

PROCESS FOR PRODUCING ISOBUTENE

Guy L. G. Debras, Belgrade; Georges E. M. J. De Clippeleir, Sint Pieters, and Raymond M. Cahen, Brussels, all of Belgium, assignors to Labofina, S.A., Brussels, Belgium

Filed Apr. 3, 1985, Ser. No. 719,192
Claims priority, application Luxembourg, Apr. 3, 1984, 85284
Int. Cl.[4] C07C *6/00*
U.S. Cl. 585—643 10 Claims

1. A process for producing isobutene wherein said process comprises the steps of:

(a) contacting at a temperature of about 300° C. or higher, a feed containing propylene with a catalyst consisting essentially of a crystalline silica polymorph of the silicalite type in the presence of a sufficient amount of steam such that the water/feed molar ratio is from about 0.5 to about 5; and

(b) recovering a stream containing isobutene.

4,556,754

PROCESS FOR THE ISOMERIZATION OF ISOLATED DOUBLE BONDS TO CONJUGATED DOUBLE BONDS IN LOW-MOLECULAR WEIGHT HOMO- AND/OR COPOLYMERS OF 1,3-DIENES

Wolfgang Kampf, Haltern, and Christoph Herrmann, Marl, both of Fed. Rep. of Germany, assignors to Chemische Werke Huels Aktiengesellschaft, Marl, Fed. Rep. of Germany

Filed Feb. 18, 1983, Ser. No. 467,978
Claims priority, application Fed. Rep. of Germany, Feb. 19, 1982, 3205990; Jul. 24, 1982, 3227685; Jul. 24, 1982, 3227684
Int. Cl.[4] C07C *5/25*
U.S. Cl. 585—664 19 Claims

1. A process for isomerizing isolated double bonds to form conjugated double bonds in a homo- or copolymer of a 1,3-diene having a molecular weight of 500–20,000, which comprises,

contacting the polymer at 0°–220° C., optionally in the presence of a solvent, with an isomerization catalyst which is selected from:

(a) a mixture of hydroxide of the alkali metals potassium, rubidium or cesium, and a C_{1-10}-hydrocarbon, mono-or-poly-alkanol, optionally substituted by $—NH_2$ or phenyl;

(b) a mixture of a lithium alcoholate or sodium alcoholate and a reaction compatible potassium, rubidium or cesium salt wherein the alcohol component is of a C_{1-10}-hydrocarbon, mono-or-poly-alkanol, optionally substituted by $—NH_2$ or phenyl; or

(c) a mixture of sodium hydroxide, a C_{1-10}-hydrocarbon, mono-or-poly-alkanol, optionally substituted by $—NH_2$ or phenyl, and a reaction compatible polar, aprotic compound.

4,556,755

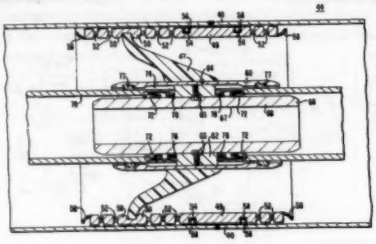
INSULATING SPACER DESIGN FOR A MODULAR GAS-INSULATED TRANSMISSION LINE

Philip C. Bolin, Wilkins Township, Allegheny County, Pa.; Gary K. Bowman, Westborough, Mass.; Charles S. Ellis, Norcross, Ga.; Melvyn D. Hopkins, North Grafton, and Richard E. Kane, Northborough, both of Mass., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 11, 1985, Ser. No. 722,568

Int. Cl.[4] H01B *9/06;* **H02G** *5/06, 15/24*

U.S. Cl. 174—21 C **11 Claims**



1. A gas-insulated transmission line comprising:

an elongated tubular outer sheath;

an inner conductor disposed within, and at a higher electrical potential than, said outer sheath, said inner conductor comprising two inner conductor sections electrically connected together;

means for electrically shielding the electrical connection of said two inner conductor sections;

an insulating gas electrically insulating said inner conductor within, and spaced apart from, said outer sheath, supporting means physically contacting and spatially supporting said shielding means within said outer sheath, said shielding means physically supporting said inner conductor sections.

4,556,756

ELECTRIC POWER CABLE IMPREGNATED WITH INSULATING FLUID

Bernardino Vecellio, Milan, Italy, assignor to Societa' Cavi Pirelli S.p.A., Milan, Italy

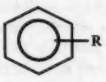
Continuation-in-part of Ser. No. 339,162, Jan. 13, 1982, abandoned. This application Nov. 3, 1983, Ser. No. 549,004

Claims priority, application Italy, Jan. 16, 1981, 19164 A/81

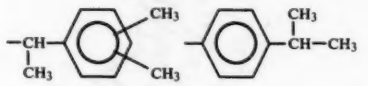
Int. Cl.[4] H01B *9/06, 7/14, 3/20*

U.S. Cl. 174—25 R **3 Claims**

1. An electric underwater cable impregnated with an insulating fluid, said cable comprising an inner conductor having at least one longitudinal conduit therewithin for the circulation of said insulating fluid, a sheath around said conductor with the interior thereof spaced from said conductor, and stratified, solid insulation intermediate said conductor and said sheath and consisting essentially of a plurality of layers of wound paper tape around said inner conductor, said layers of paper tape being impregnated with said fluid and providing insulation which will withstand the voltage between said conductor and said sheath and said tape having an air resistance, expressed in Emanueli units, not exceeding 15×10^6 cm^{-2}, said solid insulation being free of tape which would prevent flow of said fluid through said wound tape to and from said conduit and said insulating fluid comprising a substance having the formula:



where R is a radical selected from the group consisting of:



and mixtures thereof, said fluid having a density and a viscosity at 20° C., respectively, from about 0.97 gr/cm^3 to about 1 gr/cm^3 and from about 8 centipoises to about 12 centipoises.

4,556,757

PROTECTIVE COVER AGAINST RADIATION

Josef Oberbach, Grunwald, Fed. Rep. of Germany, assignor to Michael Geiseler DBF-Vertriebs-GmbH, Munich, Fed. Rep. of Germany

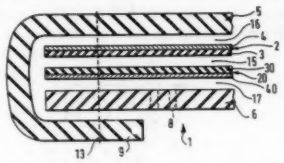
PCT No. PCT/EP82/00214, § 371 Date Jun. 20, 1983, § 102(e) Date Jun. 20, 1983, PCT Pub. No. WO83/01149, PCT Pub. Date Mar. 31, 1983

PCT Filed Sep. 23, 1982, Ser. No. 514,767

Claims priority, application Fed. Rep. of Germany, Sep. 23, 1981, 3137853

Int. Cl.[4] H05K *9/00*

U.S. Cl. 174—35 R **5 Claims**



1. A cover adapted to provide protection against radiation, said cover comprising:

first foil means comprising a plastic carrier foil with metalization layers applied on both sides of said carrier foil,

second foil means comprising a plastic carrier foil with metalization layers applied on both sides of said carrier foil,

said first and second foil means being arranged on top of each other such that a layer of air is provided between the two layers facing each other,

a first plastic protective foil arranged adjacent said first foil means and forming a layer of air therebetween,

a second plastic protective foil arranged adjacent said second foil means and forming a layer of air therebetween, and

a grounding cord connected to said metallization layers.

4,556,758

PADMOUNTED TRANSFORMER

Gary A. Warden, Fulton, Mo., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 8, 1984, Ser. No. 618,843

Int. Cl.[4] H05K *5/02*

U.S. Cl. 174—50 **5 Claims**

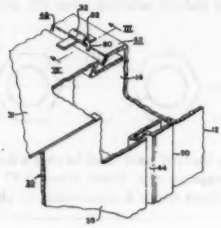
1. A padmounted transformer, comprising:

a tank having electrical terminals on a predetermined wall thereof,

and a terminal cover pivotally attached to said tank,

said cover having a closed position, with said cover and tank having portions which cooperatively define a tamper-resistant tank-cover interface, and an open position,

one portion of said interface having leg portions which define a predetermined acute angle, and the other portion



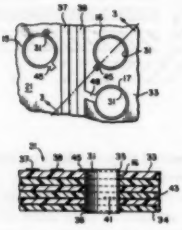
having leg portions which define an obtuse angle substantially equal to 180° minus the value of the acute angle, with a leg portion of the obtuse angle extending into the vertex of the acute angle when said cover is in its closed position.

4,556,759

PADLESS PLATED VIAS HAVING SOLDERED WICKS FOR MULTI-LAYER PRINTED CIRCUIT BOARDS

Ralph E. Iadarola, Roseland, N.J., assignor to Allied Corporation, Morris Township, N.J.

Filed Jul. 2, 1984, Ser. No. 627,131
Int. Cl.⁴ H05K *1/00*
U.S. Cl. 174—68.5 **9 Claims**



1. Multi-layer printed circuit board having a plurality of conductive traces, the conductive traces being located on a plurality of circuit layers interspaced with a plurality of insulative layers, and having a plurality of through holes which have outer boundaries and extend substantially vertically through the board to communicate with one or more of said conductive traces and with an exterior surface of the board, the through holes having an outer border which has a perimeter at said exterior surface, said through holes being plated with a conductive material of a thickness to form vias, the vias having an inner boundary forming a hole and an outer boundary, characterized by:

said outer boundary of the vias terminating before the via hole's outer border plus twice said thickness of said conductive material and;

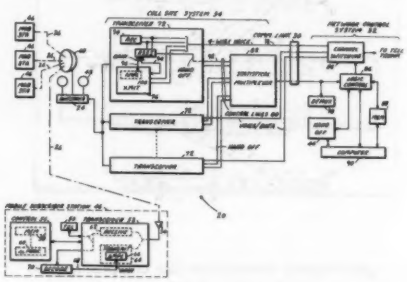
said termination being interrupted by a tab which extends partially around the via hole's outer border and extends beyond said border by more than three times the thickness of said conductive material said tab providing sufficient surface area on said exterior surface of the board to attract solder and thereby causing the solder to wick from the tab to the via by breaking the solder's surface tension, whereby osmotic pressure in the via causes the solder to coat the inner boundary.

4,556,760

HAND-OFF FILTER FOR CELLULAR MOBILE RADIO

Stuart O. Goldman, Columbus, Ohio, assignor to ITT Corporation, New York, N.Y.

Filed Jun. 11, 1984, Ser. No. 619,251
Int. Cl.⁴ H04Q *7/04*
U.S. Cl. 179—2 EB **14 Claims**



1. In a cellular mobile communication system wherein mobile transceivers can communicate with each other, the system being arranged in a set of cells wherein each cell has a cell station for communication with individual ones of said mobile transceivers, a cluster of said cells having a network station through which said cell stations communicate with each other, said network station operating in conjunction with hand-off apparatus for handing off a transceiver from a first of said cells to a second of said cells as the transceiver travels from the first cell to the second cell; the improvement wherein said hand-off apparatus comprises:

means for measuring the strength of a transceiver signal received from one of said mobile transceivers as the transceiver approaches an interface between said first cell and second cell, said measuring means including means for sampling the received signal to provide samples thereof;

means for storing a succession of said samples;

first averaging means coupled to said storing means for providing a short term average of samples in said succession of samples;

second averaging means coupled to said storing means for providing a long term average of samples in said succession of samples;

summing means coupled to said first and said second averaging means for summing a recent sample of said succession with said short term average and said long term average to provide a filtered replica of said received signals; and

means coupled to said summing means for signaling said hand-off apparatus to initiate a hand-off when the amplitude of said filtered replica drops below a predetermined value, said signaling means including means for comparing the amplitude of said filtered replica with a reference signal having said predetermined value.

4,556,761

AUTOMATIC TELEPHONE ANSWERING APPARATUS

Kazuo Hashimoto, Tokyo, Japan, assignor to Hashimoto Corporation, Tokyo, Japan

Filed Mar. 1, 1983, Ser. No. 471,217
Claims priority, application Japan, Mar. 2, 1982, 57-32821
Int. Cl.⁴ H04M *1/64*
U.S. Cl. 179—6.05 **4 Claims**

1. An automatic telephone answering apparatus comprising:

(a) relay means operated to be self-held in response to a call signal, and released by a momentary release circuit oper-

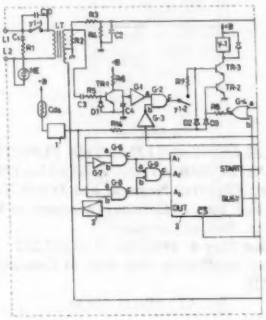
ated in response to a signal generated when a caller hangs up a receiver;

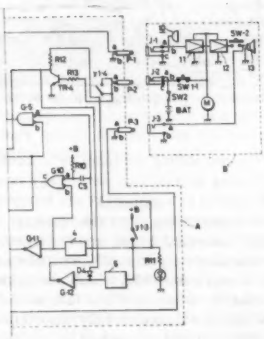
(b) means responsive to an operation of said relay means for transmitting an audio signal through a telephone line to a tape recorder;

(c) means for producing a signal to drive said tape recorder upon operation of said relay means;

(d) means for selecting a first synthesized message from a speech synthesizer upon operation of said relay means and for delivering the first synthesized message to the caller;

(e) means for disabling said momentary release circuit during a tie interval in which a message is produced from said speech synthesizer;





(f) timer means operated upon operation of said relay means;

(g) means for selecting a second synthesized message from said speech synthesizer when said timer means is turned off and for delivering the second synthesized message to the caller;

(h) means for releasing said relay means by detecting a time-off signal from said timer means and an end of delivery of the second synthesized speech message from said speech synthesizer; and

(i) means controlled by self-holding operation of said relay means for applying an operating current to means (b)–(h).

4,556,762

UNIVERSAL ADJUSTABLE TELEPHONE HANDSET HOLDER

Robert A. Campbell, 536 N. Harvey Ave., Oak Park, Ill. 60302

Filed Nov. 17, 1983, Ser. No. 552,802

Int. Cl.⁴ H04M *1/05*

U.S. Cl. 179—157 **16 Claims**

1. Apparatus for holding a telephone handset comprising:

a frame;

shoulder rest means on the bottom end of said frame for abutment with the top of a person's shoulder;

attachment means on the top end of said frame for attaching a telephone handset to said frame; and

elastic means attached to said frame for extending around a person's neck and biasing said frame towards said person's neck and thereby said handset towards said person's head, said elastic means being stretchable and in tension along its length.

4,556,763

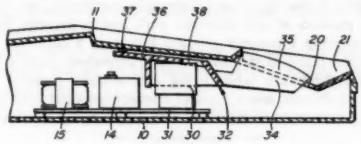
SIMPLIFIED LINE SWITCH FOR A TELEPHONE SET

Algirdas J. Dragunevicius; Gerd Kuhfus, and Charles R. S. Walker, all of London, Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Apr. 25, 1983, Ser. No. 488,439

Int. Cl.⁴ H04M *1/08*

U.S. Cl. 179—164 **3 Claims**



1. A line switch assembly for a telephone set, comprising:

a bottom housing;

a circuit board mounted on the bottom housing;

a switch assembly mounted on said circuit board and including a base and a cap on said base, said cap moveable in a direction normal to the circuit board and biased away from said circuit board;

a top housing extending over said bottom housing, and said circuit board, said top housing including a recess at one end for reception of a transducer housing of a handset, said recess displaced laterally from said switch assembly and having a bottom surface;

a slot in said bottom surface of said recess;

an actuating member resting over said cap, between said switch assembly and said top housing, said actuating member including an extension on one side extending beneath said recess and an arm extending from another side in an opposite direction to said extension;

said extension including a rib extending through said slot in said bottom surface of said recess;

said arm on said actuating member including a pivotal position at an outer end of said arm, said pivotal position being in contact with said top housing;

the arrangement such that pressure on said rib pivots said

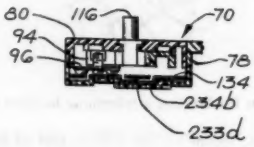
actuating member about said pivotal position to depress said cap towards said circuit board and actuate said switch assembly.

4,556,764

SLIDE ACTION ELECTRICAL SWITCHES

Andrew F. Raab, Morton Grove, and Albert R. Cobb, III, Glenview, both of Ill., assignors to Indak Manufacturing Corp., Northbrook, Ill.

Filed Mar. 5, 1985, Ser. No. 708,252
Int. Cl.[4] H01H *15/00, 1/00*
U.S. Cl. 200—16 C **36 Claims**



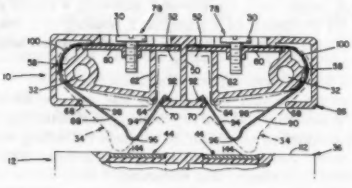
1. An electrical switch, comprising
an insulating casing,
a plurality of fixed contact plates mounted in said casing and having a plurality of fixed contact portions,
an insulating carriage mounted in said casing,
said casing having means for guiding said carriage for movement along a predetermined path,
at least one electrically conductive contactor mounted on said carriage for movement therewith along said path and for selective engagement with certain of said contact portions,
said plates including at least a first plate having a U-shaped formation bent therefrom and extending between different portions of said first plate,
said U-shaped formation including a substantially flat submarining crossover portion which is offset into a plane which is different from but substantially parallel with the plane of said different portions of said first contact plate,
said plates including at least a second plate having an overlapping portion which overlaps with and is crossed by said submarining crossover portion but is in a different plane from the plane of said submarining crossover portion and is spaced therefrom while being substantially parallel therewith to obviate any electrical contact between said submarining crossover portion and said overlapping portion.

4,556,765

SECURITY INTERFACE SYSTEM FOR A DOOR, WINDOW OR THE LIKE

Arthur W. Shaw, Syosset, and Isadore Gepner, Elmont, both of N.Y., assignors to Pittway Corporation, Syosset, N.Y.

Filed May 13, 1983, Ser. No. 494,269
Int. Cl.[4] H01H *3/16*
U.S. Cl. 200—61.71 **14 Claims**



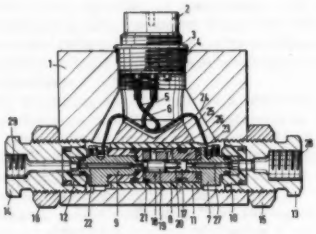
1. A device for use in a security system for monitoring a structural opening such as a door or a window comprising
a housing of electrically insulating material,
an elongated electrically conductive member,
means fixing one end of said conductive member to said housing with an intermediate portion of said conductive member protruding through an opening in said housing,
said intermediate portion including first and second portions angularly offset from one another and having a contact surface at the junction of said first and second portions for engagement by an electrically conductive actuator, and
structure in said housing adjacent said second portion for wipingly engaging and flexing said second portion as said contact surface is moved towards said housing to increase the resistance of said conductive member to flexing movement, thereby increasing the pressure at said contact surface between said conductive member and said actuator.

4,556,766

DEVICE FOR CONTROLLING THE FUNCTION OF CENTRAL LUBRICATION INSTALLATIONS

Johannes Meuer; Christian Nemack, and Dieter Todtenhaupt, all of Berlin, Fed. Rep. of Germany, assignors to Willy Vogel Ag, Berlin, Fed. Rep. of Germany

Filed May 4, 1984, Ser. No. 607,253
Claims priority, application Fed. Rep. of Germany, May 18, 1983, 8314995[U]
Int. Cl.[4] H01H *35/38*
U.S. Cl. 200—81.9 R **12 Claims**



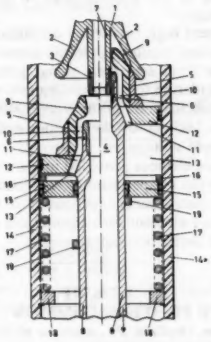
1. Device for controlling the function of central lubrication installations having at least two electrically conducting components (8,9) located in a casing (1) and integrated in a signal circuit, which components, when the lubricant is not flowing, are electrically connected to one another by means of an axially displaceable contact piston (18) located in a bore (17) of one (8) of the components (8,9), which piston, in the rest position, is in contact, by means of an end face, with an edge which surrounds the end of a flow duct (22) located in another (9) of the components (8,9) and connected to an inlet (29) for the lubricant, and which components are electrically separated from one another when the flowing lubricant lifts the end face of the contact piston (18) from the edge of the flow duct (22), characterised in that the contact piston (18) has a sealing section (19) guided in said bore (17), that a side duct (24) in said one component (8) emerges into the bore (17), the inlet opening of which side duct is closed in the rest position by the sealing section (19) of the contact piston (18) but, in contrast, is left free in the working position, and that the side duct (24) forms part of a by-pass (24, 25, 26) defined at least in part in said one component 8, said bypass being connected to the outlet (28) of the device and causing said lubricant to flow around said sealing section 19 and onto through any portion of said piston 18.

4,556,767

GAS-BLAST CIRCUIT BREAKER

Walter Egli, Baden; Klaus Ragaller; Ekkehard Schade, both of Wettingen, and Roland Stelzer, Würenlos, all of Switzerland, assignors to BBC Brown, Boveri & Company, Ltd., Switzerland

Filed May 29, 1984, Ser. No. 614,866
Claims priority, application Switzerland, May 31, 1983, 2968/83
Int. Cl.[4] H01H *33/88*
U.S. Cl. 200—148 A 14 Claims



1. Gas-blast circuit breaker comprising two contact members which are movable relative to one another and each having a respective sparking contact, a cylindrical compression chamber having a variable volume which changes based on the movement of the contact members, the chamber being filled with pressurized gas, one end face of said chamber containing an end of a channel leading to said respective sparking contact, the other end face thereof being bounded by a piston which is displaceable along a cylinder axis associated with the compression chamber, a tensioned spring below said piston, said piston being subjected to the action of said tensioned spring, the piston interacting with a fixed stop which is arranged in such a way that the movement of the piston which is subjected to the action of the tension spring is blocked, below a predetermined first pressure value of the pressurized gas present in the compression chamber, against the movement of a given one of said contact members which moves upon the occurrence of a breaking operation in the circuit breaker.

4,556,768

LIMIT SWITCH ASSEMBLY

Haruo Atsumi, Otsu; Norio Iwakiri, Kyoto; Yasuhiro Kiyono, Nagaokakyo, and Tomohiko Hayakawa, Kyoto, all of Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Jan. 12, 1984, Ser. No. 570,103
Claims priority, application Japan, Jan. 12, 1983, 58-3158[U]; Jan. 12, 1983, 58-3159[U]; Jan. 14, 1983, 58-4006[U]
Int. Cl.[4] H01H *13/06*
U.S. Cl. 200—302.2 3 Claims

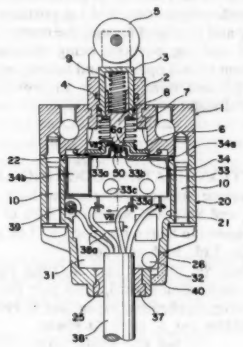
1. A limit switch assembly which comprises:

a head having an actuator movable between a first and a second operative position;

a switch having a push button protruding outwards from a first area thereof and movable between projected and depressed positions corresponding respectively to the first and second operative positions of the actuator, said switch also having at least two terminal members protruding outwards from a second area thereof for the electrical connection with external wiring elements, said switch further having at least one mounting hole defined therein;

a rubber hood configured to substantially tightly receive the switch therein except for the second area of the switch, said rubber hood having a circumferential flange formed integrally therewith so as to extend outwards therefrom in a plan generally parallel to the first area of the switch;

a switch box having an opening defined therein at a location confronting the head, and accommodating therein the switch together with the rubber hood, said circumferential flange being, when the switch is so accommodated in the switch box, positioned exteriorly of the switch box and surrounding the opening in the switch box, said switch box further having a projection formed therein for engagement into the mounting hole when the switch is accommodated in the switch box and wherein a portion of



said rubber hood corresponding in position to the mounting hole is removed to provide a cutout clearing the projection;

means for connecting the head and the switch box together with the actuator aligned with the push button through a portion of the rubber hood covering said push button, said circumferential flange being, when the head and the switch box are connected together, tightly clamped therebetween; and

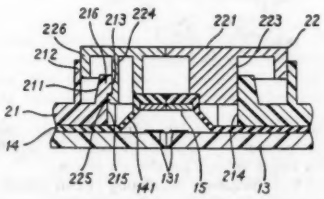
stopper means for pressing the switch against a wall of the switch box to secure said switch in position within the switch box.

4,556,769

KEY SWITCH DEVICES WITH KEY GUIDE MEANS

Hiroshi Inaba, Kawasaki, Japan, assignor to Nitsuko Limited, Kawasaki, Japan

Filed Jun. 15, 1984, Ser. No. 620,901
Claims priority, application Japan, Jun. 15, 1983, 58-90489[U]
Int. Cl.[4] H01H *3/12*
U.S. Cl. 200—340 11 Claims



1. In a key switch device which comprises an electric circuit board having a pair of fixed contacts on an upper surface thereof, a housing plate fixedly disposed on the upper surface of said circuit board and having an opening with a center axis intersecting the upper surface of said circuit board, a key

mounted on said housing plate to be movable along the center axis of said opening, supporting means for elastically supporting and urging said key upwardly, and a movable contact accompanied with said key to come into contact with said pair of fixed contacts each time that said key is pushed downwardly, the improvement wherein said housing plate has a plurality of guide grooves formed at angularly spaced locations in an inner peripheral surface of said opening to extend parallel to the center axis of said opening, said key including a face plate portion having a bottom surface, a plurality of guide projections projecting from said bottom surface of said face plate portion and slidably fitted in said guide grooves, respectively, and a plurality of leg portions projecting from the bottom surface of said face plate portion and angularly spaced from said guide projections, said leg portions being fitted into said opening and arranged around the center axis of said opening, each of said leg portions being elastically flexible in a radial direction of said opening and having engaging means for engaging with said housing plate to prevent said key from slipping out of said opening upwardly.

4,556,770

INDUCTION HEATING COOKING APPARATUS

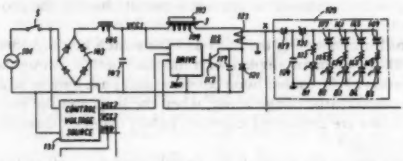
Yoshihisa Tazima; Masayuki Morishima, both of Kiryu; Hiroshi Okumura, and Shin-ichi Kasahara, both of Ashikaga, all of Japan, assignors to Sanyo Electric Co., Ltd. and Tokyo Sanyo Electric Co., Ltd., both of, Japan

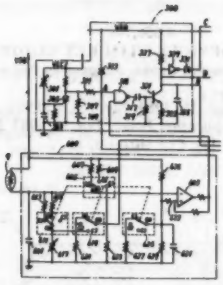
Division of Ser. No. 163,088, Jun. 26, 1980, Pat. No. 4,438,311. This application Nov. 3, 1983, Ser. No. 548,290

Claims priority, application Japan, Jul. 5, 1979, 54-85638; Jul. 5, 1979, 54-85639; Jul. 5, 1979, 54-85640

Int. Cl.[4] H05B *6/06*

U.S. Cl. 219—10.49 R **20 Claims**





1. An induction heating cooking apparatus comprising: low frequency voltage source power supply means for supplying a low frequency ripple voltage for electric power,

intermittent high frequency oscillating circuit means being supplied with said electric power causing intermittent high frequency oscillation at predetermined intervals, said high frequency oscillation being caused during an oscillation period and being stopped during a non-oscillation period,

induction heating coil means for receiving a high frequency current from said intermittent high frequency oscillating means for generating a high frequency alternating magnetic field for induction heating a load by said alternating magnetic field,

oscillation detecting means for detecting the output of said intermittent high frequency oscillating means during a period corresponding to said non-oscillation period,

oscillation stopping means responsive to said oscillation detected output from said oscillation detecting means for stopping said high frequency oscillation by said intermittent high frequency oscillating means,

start signal generating means for generating a start signal in the vicinity of the leading edge of said low frequency ripple voltage,

said intermittent high frequency oscillating means comprising self-excited oscillating circuit means responsive to said start signal from said start signal generating means for starting oscillation for maintaining said oscillation responsive to the oscillation output and for stopping said oscillation in the vicinity of the trailing end of said low frequency ripple voltage,

a heat sensitive element provided in the vicinity of said load for sensing the temperature of said load, and

temperature control means responsive to the output of said heat sensitive element for stopping the oscillation of said self-excited oscillation circuit means.

4,556,771

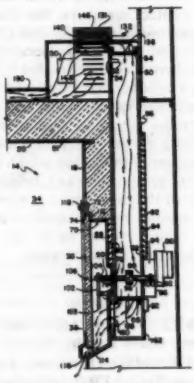
MICROWAVE FEED FOR COMMON CAVITY OVEN

Calvin J. Thomas, Orefield, Pa., assignor to Raytheon Company, Lexington, Mass.

Filed Jul. 19, 1984, Ser. No. 632,353

Int. Cl.[4] H05B *6/72*

U.S. Cl. 219—10.55 F **11 Claims**



1. A back fed microwave oven, comprising:

a microwave conductive cavity having side walls, a ceiling, a floor, a door, and a back wall with a recess with an aperture;

a microwave transparent cover substantially separating said recess from the remainder of said cavity;

a waveguide positioned behind said back wall and communicating with said recess through said aperture;

a magnetron for energizing said waveguide with microwave energy;

a horizontal rod for coupling microwave energy from said waveguide through said aperture into said recess;

a radiating antenna connected to said rod for radiating microwave energy through said cover into said remainder of said cavity;

means for rotating said rod to rotate said radiating antenna; and

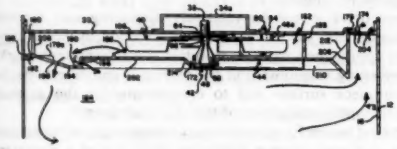
said recess having a depth substantially less than a half wavelength of said microwave energy and having side walls configured so that as said radiating antenna rotates, the distance between said antenna and said side walls varies.

4,556,772

MICROWAVE OVEN CAVITY AIR FLOW SYSTEM

Patrick R. McCammon, Cedar Rapids; Louis W. Blackburn, Norway, and Bernard J. Hershberger, Marengo, all of Iowa, assignors to Amana Refrigeration, Inc., Amana, Iowa

Filed May 7, 1985, Ser. No. 731,215
Int. Cl.[4] H05B 6/72
U.S. Cl. 219—10.55 F **13 Claims**



1. A microwave oven, comprising:
a microwave cavity having a ceiling;
a rotatable microwave energy coupling member having vanes, said coupling member being located in said cavity adjacent said ceiling;
a cradle for supporting said rotatable microwave energy coupling member, said cradle having legs suspended from said ceiling and a cross bar;
a grease shield comprising a panel substantially separating said cavity into an upper chamber housing said rotatable coupling member and a lower cooking chamber;
means for forcing air into said upper chamber;
said grease shield comprising means for channeling said air forced into said upper chamber into a directive stream directed at said vanes for rotating said coupling member, said panel of said grease shield having a channel for receiving said cross bar for limiting the turbulence induced in said directive stream;
said grease shield further comprising means for transforming said stream into a substantially uniform dispersed flow of air traveling toward the front of said grease shield for substantially uniform lateral transmission down into said lower chamber; and
said channeling and transforming means comprising vertical partitions, said vertical partition of said transforming means being sloped; and
means for exhausting air from said lower chamber of said cavity.

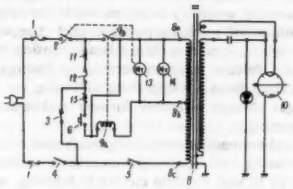
4,556,773

HIGH FREQUENCY HEATING APPLIANCE HAVING PROTECTION AGAINST RUSH CURRENTS

Takada Yoshiyuki, Sakurai, and Tamura Haruhisa, Nara, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

PCT No. PCT/JP82/00067, § 371 Date Nov. 18, 1982, § 102(e) Date Nov. 18, 1982, PCT Pub. No. WO82/03306, PCT Pub. Date Sep. 30, 1982
Continuation of Ser. No. 444,394, Nov. 18, 1982, abandoned.
This PCT application Mar. 12, 1982, Ser. No. 642,720
Claims priority, application Japan, Mar. 20, 1981, 56-40927
Int. Cl.[4] H05B 6/64
U.S. Cl. 219—10.55 C **3 Claims**

1. A high frequency heating appliance having a transformer for supplying power to a high frequency emission source, a relay contact for opening and closing a main circuit for supplying power to said transformer, a first door switch interlocked to the opening and closing of a door, said door switch opening and closing said main circuit, a second door switch which is adapted to be closed after a time delay from said opening of said first door switch when said door is opened, a bypass circuit connected in parallel to said relay contact and a monitor circuit which is opened and closed by means of said second door switch;



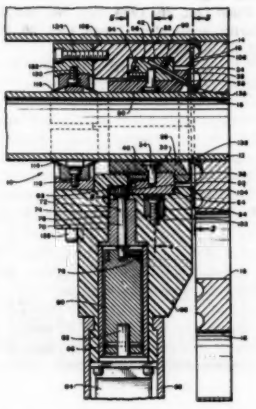
wherein a series connected circuit consisting of a circuit breaker and a current limiting device is inserted in a common circuit forming part of said monitor circuit and part of said bypass circuit and wherein said relay contact is driven by a current supplied at least through said circuit breaker.

4,556,774

WELDING APPARATUS FOR WELDING TUBES TO THE BACK FACE OF A TUBE SHEET

Gasparas Kazlauskas, 4455 Los Feliz, Apt. 1108, Los Angeles, Calif. 90027

Filed Mar. 3, 1983, Ser. No. 471,884
Int. Cl.[4] B23K 9/16
U.S. Cl. 219—60.2 **4 Claims**



1. A welding apparatus for welding of a plurality of assembled tubes to the back face of a tube sheet comprising:
a welding head housing having an internal chamber, said welding head housing having a front surface and a rear surface, said internal chamber being open ended so a said tube is capable of extending therethrough, said front surface to abut against said back face of said tube sheet;
a welding electrode housing mounted within said internal chamber, said welding electrode housing being capable of rotative movement relative to said welding head housing, said welding electrode housing being capable of being split in two separate halves, said two separate halves being securable together by securing means about said tube, a welding electrode being mounted within said welding electrode housing, said welding electrode housing being

electrically conductive, said welding electrode housing including a ring gear;

a pinion gear being in continuous engagement with said ring gear, said pinion gear being mounted on a shaft, said shaft being rotated by a motor;

a clamping assembly mounted on said welding head housing, said clamping assembly being movable between a clamping position and a release position, said clamping position tightly securing said welding head housing to the said tube, said release position permitting disengagement of said welding head housing from said tube;

an inert gas passage assembly formed within said welding head housing;

an electrical connector connecting with said welding electrode housing, said electrical connector to conduct electrical energy to said welding electrode housing, said electrical connector being continuously biased into contact with said welding electrode housing forming a sliding fit therebetween; and

said welding head housing includes a spacer ring, said spacer ring being mounted on said front surface of said welding head housing, said spacer ring being concentrically disposed relative to the said tube that is being welded to said tube sheet, said spacer ring being separatable into two separate halves forming a pair of diametrically disposed gaps therebetween, said gaps forming restrictive inert gas outlet passages for inert gas that is supplied to the tip of said welding electrode through said inert gas passage assembly, said spacer ring to abut said back face of said tube sheet.

4,556,775

AUTOMATIC SPARK-DEPOSITING APPARATUS

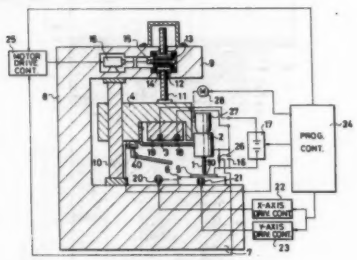
Kiyoshi Inoue, Tokyo, Japan, assignor to Inoue-Japax Research Incorporated, Japan

Filed Oct. 26, 1984, Ser. No. 665,394

Claims priority, application Japan, Oct. 26, 1983, 58-199202; Oct. 26, 1983, 58-200349

Int. Cl.⁴ B23K *9/04, 9/12*

U.S. Cl. 219—76.13 **10 Claims**



1. A spark-depositing apparatus for coating a surface of a conductive workpiece with a layer of a metallic substance, comprising:

an electrode storage means for storing a plurality of rigid but consumable, unconsumed and elongate electrodes composed of said substance;

a chuck means supported by a support member and having an inner electrode guide passage having a forward end open towards the workpiece surface and a rear open end for receiving each unconsumed elongate electrode from the storage means;

clamp means associated with said chuck means and operable to bring it into a first operating position to allow the electrode to freely move longitudinally through said passage in the direction of the workpiece surface and into a second operating position to hold the electrode fast at a given position in the passage such that the electrode lies partly projecting towards its end portion from the passage to enable an end face thereof to be located adjacent the workpiece surface;

means for activating said electrode so held in said passage to iteratively bring said electrode end face into a spark-depositing relationship with a localized portion of said surface such that an amount of said substance may be transferred from the electrode end face into the localized surface portion;

first drive means for relatively displacing said support member and the workpiece to cause said electrode end portion to effectively move over the workpiece surface so that localized spark-deposit of said substance continues to develop along a programmed path over the surface while the electrode is consumed from the end face to gradually reduce its length;

second drive means for relatively displacing said support member and the workpiece in a direction in which they are approached so as to maintain the intermittent spark-depositing relationship of the electrode end face with the workpiece surface and to compensate for the gradual consumptive reduction of the electrode length;

command means for generating a command signal representing said consumptive reduction in excess of a predetermined value to interrupt the operations of said activating means and said first and second drive means; and

control means associated with said clamp means and responsive to said command signal for bringing said chuck means into said first operating position to allow the consumed electrode to detach from said passage and one unconsumed electrode in the storage means to be introduced into said passage and thereafter bringing said chuck means into said second operating position to hold the introduced electrode fast at a said given position in said passage.

4,556,776

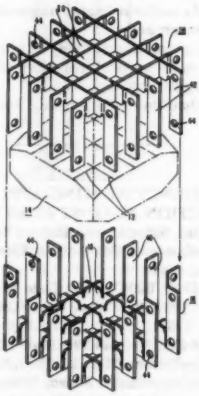
WELDING FIXTURE FOR NUCLEAR REACTOR FUEL ASSEMBLY GRID

Robert Duncan, Fork Township, S.C., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 26, 1983, Ser. No. 517,496

Int. Cl.⁴ B23K *27/00;* **B25B** *1/20*

U.S. Cl. 219—121 LC **8 Claims**



1. A nuclear reactor fuel assembly grid welding fixture, for positioning grid straps in an egg-crate array during their welding together into a nuclear reactor fuel assembly grid, comprising:

(a) a rigid bottom member having a first plurality of interleaved bottom fixture straps, fixedly arranged in a first egg-crate configuration, with top notches on their top

edges, said top notches disposed to engage the bottom edges of said grid straps when said grid straps are in alignment for welding togther into said grid;

(b) a rigid top member having a second plurality of interleaved top fixture straps, fixedly arranged in a second egg-crate configuration, with bottom notches on their bottom edges, said bottom notches disposed to engage the top edges of said grid straps when said grid straps are in alignment for welding together into said grid; and

(c) means for releasably securing said bottom member and said top member rigidly together when said grid straps are engaged in said top and bottom notches.

4,556,777

METHOD AND APPARATUS FOR WELDING LINE TRACER CONTROL

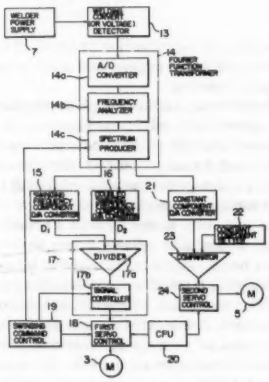
Shinichi Sarugaku, Narashino; Akira Tsuchihashi, Nagareyama, and Masao Tsuji, Funabashi, all of Japan, assignors to Hitachi, Ltd., Tokyo and Hitachi Keiyo Engineering Co., Ltd., Narashino, both of, Japan

Filed Dec. 23, 1983, Ser. No. 565,199

Claims priority, application Japan, Dec. 27, 1982, 57-226888

Int. Cl.[4] B23K *9/12*

U.S. Cl. 219—124.34 **20 Claims**



1. A method for welding line tracer control in which, during welding effected by weaving an electrode, changes in welding current flowing through the electrode are detected to tracer-control a welding torch along a welding line, wherein a swinging frequency component having the same period as a weaving period and a doubled swinging frequency component having a period which is half the weaving period are derived from a detected change in welding current, and a control output is produced to control means for controlling the center position of weaving motion of said torch to move in a direction perpendicular to said welding line until a ratio between said swinging frequency component and said doubled swinging frequency component corresponds to a predetermined value.

4,556,778

ARC WELDING AT HIGH PART SPEEDS

Dale E. Jackson, Clay, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Continuation of Ser. No. 399,389, Jul. 19, 1982, abandoned. This application Nov. 16, 1984, Ser. No. 672,169

Int. Cl.[4] B23K *9/02*

U.S. Cl. 219—125.11 **7 Claims**

4. A method of joining two thin-walled work pieces by arc welding which comprises the steps of:

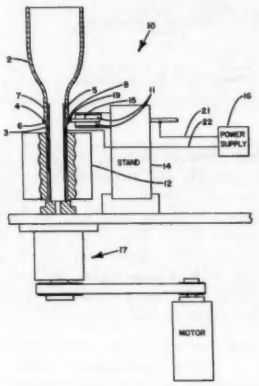
holding the work pieces together to form a path of contact between two surfaces of the work pieces;

positioning a non-consumable arc welding electrode relative to the work pieces to form an arc gap between the tip of the electrode and the work pieces at a point along the path of contact between the work pieces;

changing the relative positions of the work pieces and the electrode to repeatedly move the tip of the electrode over the path of contact between the work pieces;

supplying inert gas at the arc gap to provide an atmosphere at the arc gap which is suitable for electron flow across the arc gap;

supplying a voltage across the arc gap sufficient to create a flow of electrons across the arc gap which provides a power flow to the work pieces;



adjusting the speed of relative movement of the electrode and the work pieces to a rate which provides a power density level at the work pieces which is sufficient to melt the work pieces as the tip of the electrode moves over the path of contact between the work pieces while permitting some subsequent solidification of the melted portions after the tip of the electrode has passed and which is less than a predetermined power density level at which overheating of the work pieces is possible; and

controlling the number of times the electrode passes over the contact path between the work pieces to repeatedly cause melting and some subsequent solidification of the work pieces, the magnitude of the power supplied to the arc gap, and the speed of relative movement of the electrode and the work pieces, to provide a cumulative power flow to the work pieces which is sufficient to gradually weld the work pieces together along their path of contact.

4,556,779

TEMPERATURE CONTROL ARRANGEMENT FOR HEAT ROLLER

Kaoru Hashimoto, Toyokawa, and Kenzo Nagata, Okazaki, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Mar. 3, 1983, Ser. No. 472,171

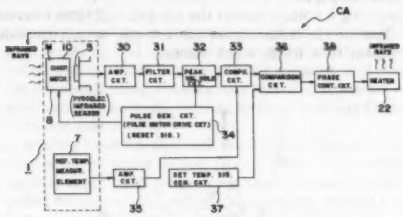
Claims priority, application Japan, Mar. 18, 1982, 57-43958; May 20, 1982, 57-86219; May 21, 1982, 57-86813; Sep. 20, 1982, 57-164510

Int. Cl.[4] G03G *15/00;* **G05D** *23/27;* **H05B** *1/00*

U.S. Cl. 219—216 **15 Claims**

1. A temperature control arrangement for a heat roller which comprises an infrared sensor unit disposed in the vicinity of the heat roller and including a pyroelectric infrared sensor; a chopper mechanism and a reference temperature measuring heat sensitive element; a set temperature signal

generating means for the heat roller; a comparing means for comparing a temperature detection value of the heat roller as detected by said sensor unit with the set temperature signal from said set temperature signal generating means; a control means for subjecting a heater element of said heat roller to on/off control based on a comparison signal of said comparing means; a composing means for composing the temperature detection value of the heat roller as detected by the pyroelectric infrared sensor and a temperature detection value of said chopper mechanism as detected by said reference temperature



measuring heat sensitive element, said comparing means being arranged to compare said temperature detection value after said value has been composed by said composing means with the set temperature signal from said set temperature signal generating means of the heat roller; and a latch means for holding said comparison signal from said comparing means at a positive edge of clock pulse signal, said control means being arranged to subject the heater element of the heat roller to the on/off control based on said comparison signal held by said latch means.

4,556,780

CERAMIC HEATER

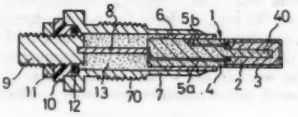
Morihiro Atsumi; Hitoshi Yoshida, both of Okazaki; Nobuei Ito, Nukata, and Kinya Atsumi, Toyohashi, all of Japan, assignors to Nippondenso Co., Ltd., Kariya and Nippon Soken, Inc., Nishio, both of, Japan

Filed Oct. 11, 1984, Ser. No. 659,959

Claims priority, application Japan, Oct. 17, 1983, 58-194696; May 7, 1984, 59-91668

Int. Cl.⁴ F23Q *7/22*

U.S. Cl. 219—270 **14 Claims**



1. A ceramic heater comprising:
- a heat generator made of a conductive ceramic sintered body;
- a supporter made of an insulating ceramic sintered body for supporting said heat generator;
- an unporous thin covering layer made of an insulating ceramic sintered body having a porosity of not more than 5% completely enclosing the outer surface of said heat generator, the covering ceramic layer preventing oxidation of said heat generator, improving the thermal shock resistance of said heat generator and preventing the heat generator from being directly exposed to water and oil;
- said ceramic sintered bodies being secured together; and
- electric current supply means for supplying an electric current to said heat generator.

4,556,781

SELF-REGULATING ELECTRIC GLOW PLUG

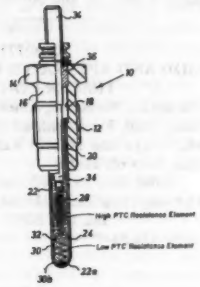
Paul Bauer, Steinheim-Murr, Fed. Rep. of Germany, assignor to Firma Beru-Werk, Albert Ruprecht, GmbH & Co. KG, Ludwigsburg, Fed. Rep. of Germany

Continuation of Ser. No. 969,634, Dec. 14, 1978, abandoned. This application Dec. 18, 1984, Ser. No. 682,490

Claims priority, application Fed. Rep. of Germany, Jan. 21, 1978, 2802625

Int. Cl.⁴ F23Q *7/00;* **F02P** *19/02;* **H05B** *3/00*

U.S. Cl. 219—270 **4 Claims**



1. Glow plug for a combustion-chamber of an air-compressing internal combustion engine, said glow plug comprising:
- a glow plug housing;
- a tube fixed at one end to the glow plug housing, the tube being closed at its end located opposite to the plug housing, the closed end of the tube extending out of the plug housing and defining a tubular component,
- a thermally conductive electrical insulating material located in said tubular component,
- a resistance element in the form of a coiled resistance wire located within said tubular component, said resistance element being embedded in said insulating material with said insulating material completely filling a space between said coiled resistance wire and said tubular component,
- a connecting device located on said glow plug housing and being electrically connected to said resistance element to provide a glow current thereto, the resistance element having a positive temperature-resistance-coefficient for regulation of the glow current,
- the resistance element including two resistance wire coils located within said tubular component and connected in an end-to-end serially connected array with one resistance wire coil being located closest to said glow plug housing and the other resistance coil wire being located closest to the closed end of said tube, the resistance wire coil located closest to said glow plug housing having a higher positive temperature-resistance-coefficient than the positive temperature-resistance-coefficient of the resistance wire coil located closest to the closed end of the tube, and
- the resistance coil located closest to the closed end of the tube defining a heating element for the combustion chamber of the air-compressing internal combustion engine and including the capability of heating the entire portion of the tube defining the tubular component in which both resistance wire coils embedded in the insulting material are located to incandescence within three to five seconds after being energized whereby the resistance of the coil closest to the glow plug housing is affected not only by heat produced by current flowing through it but also by the heat of the tubular component heated to incandescence by the other coil so that the resistance of the coil closest to the plug housing increases to reduce the initially high current through the serially connected coils.

4,556,782

HAND-HELD HAIR DRYER

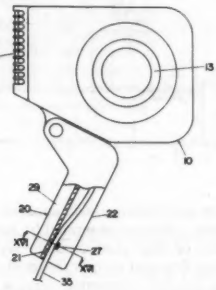
Nobuichi Fujishima, Hikone, and Kuniharu Ichikawa, Kyoto, both of Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

Filed Sep. 13, 1983, Ser. No. 531,732

Claims priority, application Japan, Dec. 10, 1982, 57-187814[U]; Feb. 17, 1983, 58-25959

Int. Cl.⁴ H05B *1/00*; A45D *20/10*

U.S. Cl. 219—370 **7 Claims**



1. A foldable hair dryer of hand-held type which comprises, a housing with a front edge, an adjacent bottom edge and opposed edges defining a housing periphery, said housing further having an air inlet, and an air discharge outlet on said front edge, and a first groove formed along at least a portion of the periphery, electrically operated means incorporated in the housing for producing a flow of heated air,

an elongated hand grip pivotally attached to the housing between said front and bottom edges,

said hand grip comprising a web extending substantially along the entire length thereof and a pair of flanges extending along both sides of the web to define a second groove an H-shaped cross section, including a second groove on one side of the web, said second groove being of substantially the same width as the first groove, and on the other side of the web defining a cap portion for covering the air discharge outlet;

said hand grip being pivotally attached so as to be rotatable to a folded position where it is folded over said front edge so that said cap portion covers the air discharge outlet and to an operational position where it extends outwardly from the housing to be grasped by a user, and said first groove in the housing cooperating, when the hand grip is brought in the folded position, with the second groove in the hand grip to define a peripheral channel which is adapted to receive therein the power cord wound around the periphery of the hair dryer;

means for pivotally attaching the hand grip to the housing comprising:

an inclined edge extending between said front edge and said bottom edge to define thereunder a recess with a flat bottom;

a pivot pin extending through said recess;

the hand grip having at its end which is pivotally attached to the housing, a pair of yokes extending from the handle, at least one of said yokes having an outer edge;

said yokes being secured to the pivot pin in such a manner that the yoke outer edge abuts the inclined edge so a securely to retain the hand grip in at least one of the extended or folded positions.

4,556,783

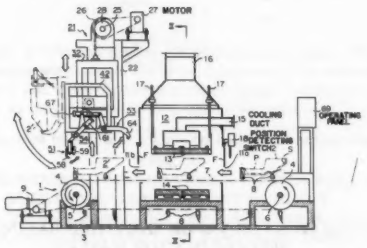
HEAT WELDING APPARATUS

Kazuo Naruse, Okazaki; Koji Yokoi, Shippo, and Yoshiaki Kurokawa, Toyota, all of Japan, assignors to Trinity Industrial Corporation, Tokyo and Toyota Motor Corporation, Toyota, both of, Japan

Filed Nov. 14, 1983, Ser. No. 551,604

Int. Cl.⁴ F27B *9/06*; F27D *11/00*; B65G *47/24*

U.S. Cl. 219—388 **5 Claims**



1. A heat bonding apparatus for bonding an asphalt sheet to a press-formed steel sheet to form a dash panel for separating the passenger compartment of an automobile from an engine compartment thereof with the asphalt sheet serving as sound-proof antivibratory material, said apparatus comprising:

a chamber having an inlet and an outlet on opposite sides thereof and an exhaust duct in the upper portion thereof for exhausting gases generated during bonding;

a conveyor mechanism extending through said chamber from the inlet to the outlet for carrying an assembly of the press-formed steel sheet and the asphalt sheet laminated on said steel sheet through said chamber;

conveyor driving means connected to said conveyor mechanism for intermittently driving said conveyor mechanism;

near infrared radiators for heating the assembly disposed respectively above and below said conveyor mechanism for heating an assembly which has been fed into the chamber and stopped therein by said conveyor mechanism and said conveyor driving mechanism, each of said radiators being a near infrared halogen tube having a maximum energy distribution at a wavelength of 0.5 to 2 μm and having a cooling duct for cooling the radiator; and

a withdrawing mechanism disposed in proximity to the outlet of said chamber for gripping the dash board product composed of the steel sheet and the asphalt sheet heat bonded to the steel sheet while said product is still hot and withdrawing it from said conveyor mechanism and rotating it to a position for delivery to an assembly line as it cools.

4,556,784

METHOD FOR CONTROLLING VERTICALLY ARRANGED HEATERS IN A CRYSTAL PULLING DEVICE

Ryusuke Nakai, Osaka, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Oct. 7, 1983, Ser. No. 539,905

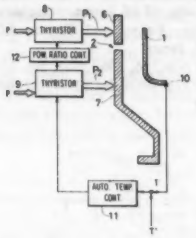
Claims priority, application Japan, Oct. 8, 1982, 57-177899

Int. Cl.⁴ F27B *14/00*

U.S. Cl. 219—425 **3 Claims**

1. In a method for pulling a single crystal from a melt in a crucible surrounded by a plurality of vertically disposed electrical heaters connected to respective sources of controlled electrical power comprising controlling one of said heaters by means of an automatic temperature controller and controlling

the remaining heaters by maintaining a predetermined power ratio of the controlled power for the remaining heaters with



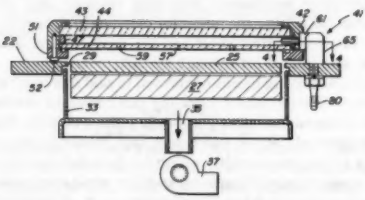
respect to the controlled power for said one of said one heaters.

4,556,785

APPARATUS FOR VAPOR SHEATHED BAKING OF SEMICONDUCTOR WAFERS

John Blechschmid, Chagrin Falls, Ohio; Richard D. Coyne, San Jose, Calif.; David Palmer, Andover, Mass., and John A. Piatt, Sunnyvale, Calif., assignors to GCA Corporation, Bedford, Mass.

Filed May 23, 1983, Ser. No. 496,818
Int. Cl.⁴ H05B *3/68*
U.S. Cl. 219—460 **8 Claims**



1. Heat treating apparatus for performing vapor sheathed baking of semiconductor wafers, said apparatus comprising:

a circular hot plate of a conductive material providing substantially uniform temperature over the diameter of said plate;

heater means for bringing said plate to a preselectable controlled temperature;

an exhaust chamber around and under said plate and heater, there being a uniform annular gap between the periphery of said plate and said chamber;

over said hot plate, a cap structure which substantially covers said hot plate while allowing wafers to be brought to and taken from said hot plate and which includes means for providing an outward vapor flow over the surface of a wafer resting on said plate, said gas flow being then drawn into said exhaust chamber through said annular gap.

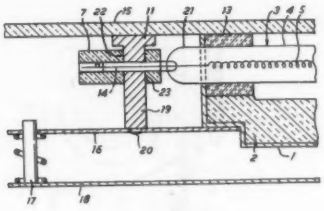
4,556,786

HEATING APPARATUS

Kenneth S. Frost, Broxbourne; Alex L. Halberstadt, London, and John A. Letchford, Enfield, all of England, assignors to Thorn EMI Domestic Appliances Limited, London, England

Filed Jun. 15, 1984, Ser. No. 620,842
Claims priority, application United Kingdom, Jun. 15, 1983, 8316304
Int. Cl.⁴ H05B *3/68*
U.S. Cl. 219—464 **9 Claims**

1. Heating apparatus for mounting beneath a glass ceramic layer of a cooking hob, said apparatus including an infra-red lamp and thermally-insulative material below said lamp, said lamp comprising a generally tubular envelope formed from an electrically-insulative and thermally-conductive material, a filament supported within said envelope, first and second pinch seals formed integrally with said envelope and closing respective ends of said envelope, electrical connections to respective ends of said filament sealed within said pinch seals, and first and second ceramic housings substantially enclosing respectively said first and second pinch seals, and an aperture pro-



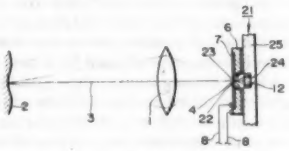
vided in each of said housings, said apparatus being adapted to constrain thermal radiation generated by said lamp to a predetermined region of said glass ceramic layer, said apparatus further including first and second thermally-conductive members extending into said respective ceramic housings through said apertures, said members being located in direct thermal contact with respective upper surfaces of said pinch seals and an undersurface of said glass ceramic layer so as to conduct heat, when mounted, from said pinch seals in a substantially upward direction towards said glass ceramic layer outside of said predetermined region.

4,556,787

PHOTOSENSOR FOR OPTICAL OBSERVING OR PHOTOGRAPHING DEVICES

Yoshio Shishido, Sagamihara; Shinichi Nishigaki, Tokyo; Shinichi Kato, Hachioji; Kazumasa Matsuo, Tama; Atsushi Miyazaki; Susumu Takahashi, both of Hachioji; Takeaki Nakamura, Hino, and Akibumi Ishikawa, Hachioji, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Mar. 14, 1983, Ser. No. 475,292
Claims priority, application Japan, Mar. 23, 1982, 57-46084; Mar. 23, 1982, 57-46085
Int. Cl.⁴ G01J *1/20*
U.S. Cl. 250—201 **5 Claims**



1. In combination

a lens disposed on an optical axis;

a light receiving surface facing said lens and having a photoelectric converting function, said surface having an operture therein on said optical axis for receiving a focused image of the object from said lens;

a light emitting means disposed on an opposite side of said surface from said lens for passing a light along said optical axis through said lens to an object; and

light intercepting means for preventing the light from said light emitting means from leaking directly to said light receiving surface, said light intercepting means including a plate on

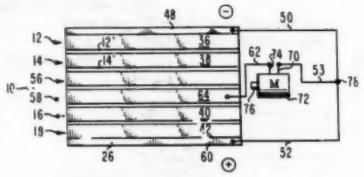
said opposite side of said light receiving surface with an opening on said optical axis smaller than said aperture in said light receiving surface.

4,556,788

AMORPHOUS SILICON CELL ARRAY POWERED SOLAR TRACKING APPARATUS

Joseph J. Hanak, Lawrenceville, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Nov. 17, 1983, Ser. No. 552,726
Int. Cl.⁴ G01J *1/20*
U.S. Cl. 250—203 R **6 Claims**



1. A solar tracking apparatus tiltable about a diurnal axis comprising:

a plurality of amorphous silicon solar cells serially connected in an array between first and second end cells;

a direct current motor having a pair of input terminals, the motor having a shaft tending to rotate in first and second opposite directions corresponding to the polarity of the direct current voltage applied to said input terminals, said cells being coupled to said shaft for rotation in response to the shaft rotation;

means for ohmically connecting said end cells to one of said input terminals and for ohmically connecting a cell central to said array to the other of said input terminals such that the cells between said central cell and said end cells form first and second cell groups, the voltage across said cell groups tending to be the same in magnitude and opposite in polarity when said cells are all fully illuminated in a reference orientation relative to the sun and of different magnitudes and opposite in polarity when at least one cell of one group is shadowed in an orientation different from said reference orientation;

said motor being responsive to the net voltage and its polarity generated by the cell groups and applied to said input terminals for rotating in a direction corresponding to the net voltage polarity; and

means adjacent said array for shadowing said at least one cell of said one group when said cells are in said different orientation, the polarity of the net voltage of said groups of cells being such that the net voltage tends to cause said motor to return said cells to said reference orientation.

4,556,789

MEASURING CIRCUIT FOR PHOTO-RECEIVING INTENSITY OF PHOTOSENSOR

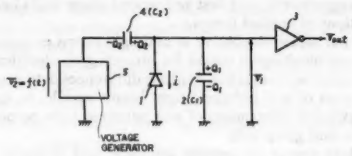
Yokoyama Shotaro, and Nishibe Takashi, both of Yokosuka, Japan, assignors to Fuji Electric Company, Ltd., Japan

Filed Feb. 18, 1983, Ser. No. 467,870
Claims priority, application Japan, Feb. 22, 1982, 57-25978
Int. Cl.⁴ G01J *1/46*; H01J *40/14*
U.S. Cl. 250—206 **3 Claims**

1. A measuring circuit for measuring the light intensity received by a photo-receiving photosensor, comprising:

a photosensor for receiving light and for generating photocurrent depending on the intensity of received light;

an integration means for integrating the photocurrent through said photosensor and which is adapted to measure the photo-receiving intensity by measuring the period of time from the instance of the start of integration to the time at which the integrated value reaches a predetermined level in said integration means; and



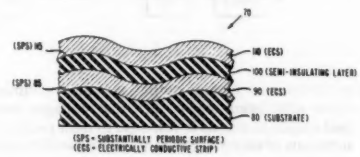
a signal generation means for generating a signal which changes with time in the same direction as the integrated value, and wherein said generation means is connected to add its output signal to said integrated value.

4,556,790

PHOTODETECTOR HAVING A CONTOURED, SUBSTANTIALLY PERIODIC SURFACE

Alastair M. Glass, Rumson, and Paul F. Liao, Fair Haven, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Nov. 30, 1982, Ser. No. 445,461
Int. Cl.⁴ H01L *31/00*
U.S. Cl. 250—211 J **22 Claims**



1. A photodetector, comprising:

a body which undergoes a detectable change when exposed to electromagnetic radiation, and which includes means for detecting said change when the body is exposed to electromagnetic radiation, CHARACTERIZED IN THAT

said body also includes a contoured surface which is substantially periodic and includes prominences, the average spacing, Λ, between, and the composition of, said prominences being chosen to couple at least a portion of said radiation into said body in the form of a propagating electromagnetic wave traveling through said body adjacent said contoured surface and/or localized plasma resonances within said prominences.

4,556,791

PHOTOELASTIC SENSOR USING A VARIABLE INTENSITY LIGHT SOURCE AS A FEEDBACK MEANS

William B. Spillman, Jr., Acton, Mass., assignor to Sperry Corporation, New York, N.Y.

Filed Jun. 7, 1983, Ser. No. 502,052
Int. Cl.⁴ G02F *1/01*
U.S. Cl. 250—225 **2 Claims**

1. Apparatus for measuring applied forces comprising:

a light source of constant intensity,

means for directing light from said source into a collimated beam, polarizing means coupled to receive said collimated beam and positioned to produce a light beam polarized at a predetermined angle with respect to a given axis,

wave retardation means for providing phase changes to said polarized light beam in response to voltages applied thereto,

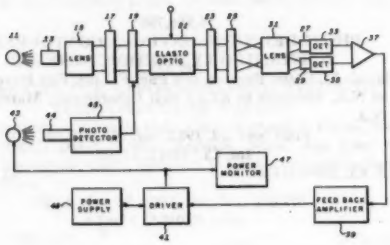
birefringent means positioned to receive light from said

wave retardation means and oriented to provide first and second phase shifts for components of polarized light beams parallel to and at right angles to said given axis respectively, said first and second phase shifts being functions of applied forces,

output means responsive to said light beams emanating from said birefringent means for providing an electrical output signal representative of phase differences between components of said polarized light beams parallel to said given axis and components of said polarized light perpendicular to said given axis,

a light source of variable intensity, said intensity being a function of voltages applied to said light source;

feedback means coupled between said variable light source and said output means for coupling signals representative of said phase difference representative signals to said variable light source,



a photodetector having output terminals coupled to said wave retardation means such that voltages produced at said output terminals in response to light received at input terminals of said photodetector are provided to said wave retardation means as said applied voltages,

optical fiber means coupled to said input terminals of said photodetector and positioned to receive light from said variable light source for coupling light emanating from said variable light source to said input terminals of said photodetector, and

means coupled to said feedback means for monitoring electrical power feedback to said wave retardation means, said feedback power being indicative of said applied forces when voltages coupled from said photodetector to said wave retardation means causes phase changes to said polarized light that annul phase shifts caused by said applied forces to said birefringed means.

4,556,792

ROTARY ENCODER ASSEMBLY AND INSTALLATION FIXTURE

Takao Kano, Mitaka, and Katsuhiko Makino, Tokyo, both of Japan, assignors to Sumtak Corporation, Tokyo, Japan

Filed May 12, 1983, Ser. No. 493,813
Int. Cl.[4] G01D *5/34*
U.S. Cl. 250—231 SE **5 Claims**

1. An optical rotary encoder assembly and installation fixture to be installed on a rotatable shaft, said assembly and installation fixture comprising a casing having a light-emitting element therein and a first unit combined with said casing, said first unit comprising:

(a) a rotary member which, during use of the encoder, is rotated about a central axis, said rotary member comprising:

(i) a boss having a central bore which extends therethrough and which is concentric with said central axis, said central bore being adapted to be mounted on rotary shaft the rotary speed of which is to be measured by the rotary encoder, and

(ii) a rotary slit disc mounted on said boss perpendicularly to said central axis, said rotary slit disc having a plurality of slits extending therethrough in parallel to said central axis, said plurality of slits being radial to said central axis and being arranged around said central axis at regular angular intervals;

(b) a stationary member which, during use of the encoder, is stationary relative to said rotary member, said stationary member comprising:

(i) a fixing body having a central bore which extends therethrough concentrically with said central axis, said central bore being sized and shaped to journal said boss;

(ii) at least two arms which extend from said fixing body in a first direction parallel to said central axis;

(iii) a printed plate mounted on said fixing body adjacent to said rotary slit disc, said printed plate having a photodetector mounted on the surface of said printed plate adjacent to said rotary slit disc in position to detect light shown through said plurality of slits during use of the encoder; and

(c) an installation fixture which, during transport of the encoder, is rigidly fixed to said stationary member, said installation fixture comprising:

(i) a connecting plate which is attached to said at least two arms and

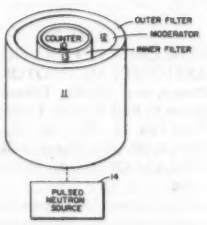
(ii) a plate support which is mounted on said connecting plate, said plate support bearing against said rotary member and preventing axial motion thereof during transport of the encoder.

4,556,793

EPITHERMAL NEUTRON LIFETIME LOGGING

Linus S. Allen, Dallas, and William R. Mills, Duncanville, both of Tex., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Apr. 7, 1983, Ser. No. 482,751
Int. Cl.[4] G01T *3/00*
U.S. Cl. 250—267 **14 Claims**



1. A method for measuring the epithermal neutron lifetime characteristic of a subsurface formation surrounding a borehole, comprising the steps of:

(a) irradiating the subsurface formation surrounding the borehole with repetitive bursts of fast neutrons, and

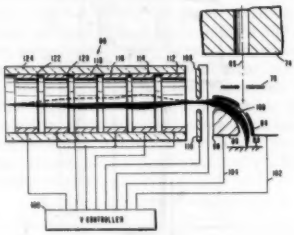
(b) moderating the neutron radiation returning to the borehole between said repetitive bursts of fast neutrons to extend the epithermal neutron lifetime of said returning neutron radiation without merging said epithermal neutron lifetime into the thermal neutron lifetime of said returning neutron radiation.

4,556,794

SECONDARY ION COLLECTION AND TRANSPORT SYSTEM FOR ION MICROPROBE

James W. Ward, Canoga Park; Herbert Schlanger, Simi Valley; Hugh McNulty, Jr., Santa Monica, and Norman W. Parker, Camarillo, all of Calif., assignors to Hughes Aircraft Company, El Segundo, Calif.

Filed Jan. 30, 1985, Ser. No. 696,616
Int. Cl.[4] G01N *23/00*; H01J *37/26*
U.S. Cl. 250—309 28 Claims



1. A secondary ion collection and transport system for an ion microprobe, the microprobe directing a primary ion beam onto a target to form secondary ions as a result of the beam's impact, comprising:

means for collecting secondary ions from the target area and directing the ions into general alignment with a desired transport path;

a plurality of spaced electric field members distributed along the desired ion path, the field members being adapted to produce electrostatic fields in response to applied electrostatic voltages; and

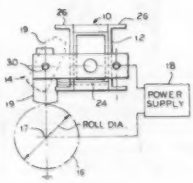
means for applying electrostatic voltages to the respective field members such that the ions are alternately accelerated and focused by the electrostatic fields produced by successive members, and emerge from the desired path with a substantially smaller velocity than their maximum velocity during transit along the path.

4,556,795

CORONA DISCHARGE DEVICE

Andreas Tietje, Tariffville, Conn., assignor to Ensign-Bickford Industries, Inc., Simsbury, Conn.

Continuation-in-part of Ser. No. 443,065, Nov. 19, 1982, abandoned. This application Aug. 15, 1983, Ser. No. 523,169
Int. Cl.[4] G03G *15/00*
U.S. Cl. 250—324 12 Claims



1. A corona discharge device including a first electrode formed of a conductive material,

a plurality of segments,

support means for mounting said segments in an operative position adjacent said first electrode,

each segment including a hollow insulator defined by an outer surface adjacent said first electrode and a wall extending away therefrom,

a conductive body disposed within said insulator and in an opposed relation to said first electrode,

conductive means connected to said conductive body and extending outwardly from said insulator for being coupled to said support means,

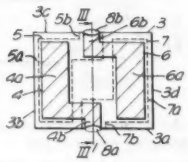
and an insulating material filling the remaining portion of said insulator and surrounding said conductive means.

4,556,796

INFRARED RADIATION DETECTOR

Martin Renals, Southampton, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 11, 1984, Ser. No. 619,429
Claims priority, application United Kingdom, Jul. 6, 1983, 8318273
Int. Cl.[4] G01J *5/00*
U.S. Cl. 250—338 20 Claims



1. An infrared radiation detector comprising:

a pyroelectric body having first and second opposite major surfaces;

first and second electrodes arranged opposite one another on the first and second major surfaces, respectively, said first and second electrodes and a portion of the pyroelectric body therebetween forming a first pyroelectric detector element; and

third and fourth electrodes arranged opposite one another on the first and second major surfaces, respectively, said third and fourth electrodes and a portion of the pyroelectric body therebetween forming a second pyroelectric detector element; and

characterized in that:

the first and fourth electrodes have extended portions which overlap each other at an edge of the pyroelectric body; and

the detector further comprises edge connection means for electrically connecting the extended portions of the first and fourth electrodes.

4,556,797

METHOD AND APPARATUS FOR DETECTING EDGE OF FINE PATTERN ON SPECIMEN

Asahiro Kuni, Tokyo; Toshimitsu Hamada, Yokohama; Hiroshi Makihira, Yokohama, and Kazushi Yoshimura, Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 7, 1983, Ser. No. 530,044
Claims priority, application Japan, Sep. 9, 1982, 57-155811
Int. Cl.[4] H01J *37/00*
U.S. Cl. 250—492.2 3 Claims

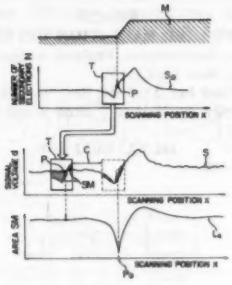
1. A method of detecting the edge of a fine circuit pattern formed on a semiconductor device, comprising the steps of:

storing a model wave form signal representing the estimated amount of secondary electrons to be obtained at each scanning position on a line intersecting the edge of said circuit pattern along which an electron beam is to be

scanned, said model wave form signal being determined on the basis of the material of the circuit pattern, a cross section of the circuit pattern, the acceleration voltage of the electron beam which is to scan the circuit pattern and the diameter of the electron beam;

projecting an electron beam from an electron lens system onto successive scanning points along said scanning line extending at least across the edge portion of said fine circuit pattern;

sequentially detecting secondary electrons emitted from each of the scanning positions on the scanning line resulting from the irradiation of said circuit pattern by said electron beam and storing an actual wave form signal



representing the amount of detected secondary electrons at each said scanning position; and

comparing said actual wave form signal and said model wave form signal while shifting the model wave form signal with respect to the actual wave form signal in the direction of said scanning, thereby obtaining a measure of the degree of inconsistency between the actual wave form signal and the model wave form signal for each point on the actual waveform signal to detect a position representing the position of the edge along the scanning point direction on the basis of a designated position in said model wave form signal when the highest coincidence exists between the actual waveform signal and said model waveform signal.

4,556,798

FOCUSED ION BEAM COLUMN

Charles M. McKenna, Newbury Park; William M. Clark, Jr., Thousand Oaks, and Robert L. Seliger, Agoura, all of Calif., assignors to Hughes Aircraft Company, El Segundo, Calif.

Filed Jul. 12, 1983, Ser. No. 512,879
Int. Cl.⁴ H01J *37/30, 37/317*
U.S. Cl. 250—492.2 **19 Claims**

1. A two lens focused ion beam column capable of scanning an approximately 1 mm. square field with an aberration limited spot having a diameter no more than about 0.1 μm, comprising:

an ion source for producing positively charged ionic particles including a desired ion species;

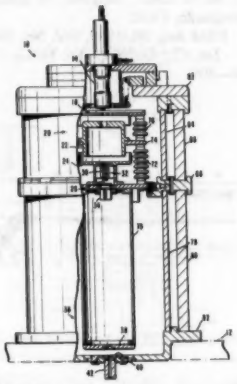
an extraction electrode for extracting positively charged ion particles from the ion source to form an ion beam;

a mass separator including an analyzer slit;

a first lens positioned between said extraction electrode and said analyzer slit for focusing the desired species of ion in the ion beam onto said analyzer slit with a spot size of less than about 0.5 μm, said first lens being configured to be an accelerating lens which increases the beam energy and has a magnification of about unity;

a second lens downstream from said analyzer slot for focusing the beam of desired ion species to a spot having a diameter of no more than about 0.1 μm on a target plane on a target mounting means, said second lens being configured to be an accelerating and demagnifying lens which increases the beam energy;

an elongate deflector positioned between said second lens and said target plane for deflecting the beam over a pattern within a scanfield on the desired plane, the working distance between the second lens and the target plane being long enough for the deflector to scan the beam over an approximately 1 mm. square field with deflection angles of no greater than about 10 mrad., whereby aberration-induced increases in spot size at the target plane are limited to no more than about 25%; and



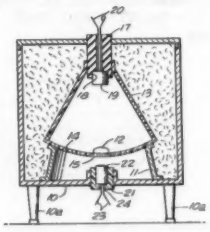
power supply means connected to said source, said extraction electrode, said first lens, said second lens and said target mounting means for increasing the energy of the beam through said first and second lenses at substantially equal voltage ratios, for focusing the ion beam through said first lens with near unity magnification so that a substantially unmagnified, aberration limited image of said source appears at said mass analyzer slit, and for focusing the ion beam through said second lens with demagnification sufficient to focus the beam to a spot on the target plane.

4,556,799

MOTION SENSING APPARATUS WITH VARIABLE THRESHOLD

John L. Rolando, 724 S. Beacon Ave., Apt. 5, Los Angeles, Calif. 90017

Continuation of Ser. No. 135,299, Mar. 3, 1980, abandoned. This application May 3, 1982, Ser. No. 374,184
Int. Cl.⁴ G01F *23/00*
U.S. Cl. 250—577 **2 Claims**



1. A motion sensor comprising:

a substantially opaque inertial element movably supported

upon a carrier for said element presenting a substantially opaque, concave upper spherical surface having a translucent window area at its lowest part, said inertial element being of such size as to cover at least a portion of said window area and capable of omnidirectional uninterrupted movement on said concave spherical surface;

a light source;

a single phototransistor shielded from light other than light from said light source, said light source and said phototransistor being positioned on opposite sides of said window area and aligned one with the other with said inertial element interposed therebetween, and said light source and phototransistor being interchangeable on opposed sides of said window area, whereby upon generally unrestricted directional movement of said inertial element over said window area the amount of light passing through said window reaching said phototransistor from said light source will be varied;

signal emitting means including phototransistor controlled means for emitting a signal in response to a change in the amount of light reaching said phototransistor, said phototransistor controlled means comprising a differential comparator having two inputs, one of said inputs being responsive to the output of said phototransistor and the other of said outputs including a potentiometer for varying the potential applied thereto, and a monostable multivibrator controlled by said differential comparator upon a change of state from high to low thereof to emit a pulse; and

adjustment means to vary the duration of a pulse emitted by said multivibrator.

4,556,800

OPTICAL IMAGE SENSOR APPARATUS WITH GROUPED PHOTOSENSORS CONNECTED IN COMMON

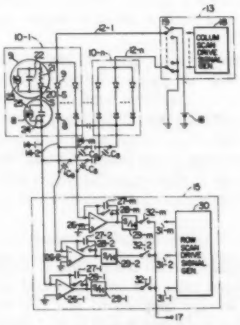
Hisao Ohta, Yokosuka; Toru Baji, Kodaira; Yuji Izawa, Sayama; Eizou Ebisui, Yokohama; Toshihisa Tsukada, Tokyo, and Hideaki Yamamoto, Tokorozawa, all of Japan, assignors to Nippon Telegraph & Telephone Public Corp. and Hitachi, Ltd., both of Tokyo, Japan

Filed Mar. 29, 1983, Ser. No. 479,893

Claims priority, application Japan, Apr. 2, 1982, 57-53799

Int. Cl.⁴ H04N *3/14*

U.S. Cl. 250—578 **7 Claims**



1. An optical image sensor apparatus, comprising:

a plurality of photosensors arrayed in a primary scan direction, said photosensors being classified into a number of groups each including a predetermined number of said photosensors, and the outputs of those photosensors which occupy equivalently the same positions in said groups being connected together;

a column scan control circuit for sequentially selecting said groups; and

a signal readout circuit for sequentially and selectively scanning the outputs of said photosensors in each of said groups to thereby produce readout signals, including a plurality of integrators each connected to a respective one of the commonly connected outputs of said photosensors, a first circuit for sequentially and selectively scanning the outputs of said plural integrators, and a row scan control circuit for generating a driving pulse signal for said first circuit.

4,556,801

METHOD FOR UTILIZING WIND ENERGY FOR AUTONOMOUS ELECTRICITY PRODUCTION

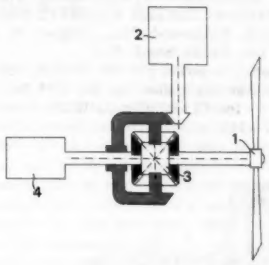
Vincenzo Gervasio, and Antonio Rossi, both of Milan, Italy, assignors to Snamprogetti S.p.A., Milan, Italy

Filed Jun. 21, 1982, Ser. No. 390,502

Claims priority, application Italy, Jul. 7, 1981, 22777 A/81

Int. Cl.⁴ F03D *9/00*

U.S. Cl. 290—44 **9 Claims**



1. A method for utilizing wind energy for constant frequency electricity production, characterised in that a wind rotor is coupled by means of an angular speed summation mechanism to an auxiliary direct current electric motor and to a generator which is maintained at constant angular speed, the angular speed of said generator being greater than or equal to the angular speed of such wind rotor said summation mechanism comprising a differential having a pinion spider connected to said generator and two axles, the first of said two axles connected to said auxiliary electric motor and the second of said two axles connected to said wind rotor.

4,556,802

UNINTERRUPTIBLE AC POWER SUPPLY

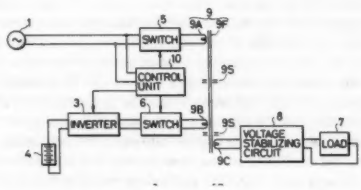
Kosuke Harada, Fukuoka; Katsuaki Murata, Kumamoto, and Takazi Nakamizo, Fukuoka, all of Japan, assignors to Nishimu Electronics Industries, Co., Ltd., Fukuoka, Japan

Filed Feb. 24, 1984, Ser. No. 583,345

Claims priority, application Japan, Mar. 24, 1983, 58-47902

Int. Cl.⁴ H02J *9/06*

U.S. Cl. 307—66 **5 Claims**



1. An uninterruptible ac power supply, comprising in combination an iron core divided by magnetic shunts into first and second terminal side sections and a center section therebe-

tween, a three-winding transformer incorporating one output winding formed on the first terminal side section and two input windings formed one each on the remaining two sections, an inverter unit connected to one of said two input windings, a commercial ac line connected via switch means to the other of said two input windings, a battery connected to said inverter unit and adapted to supply power thereto, and means for controlling to a predetermined value the phase difference between the output voltage of said inverter unit and the voltage of said commercial ac line.

4,556,803

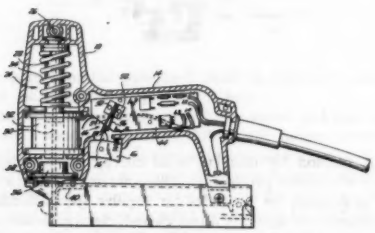
TRIGGER SWITCH CIRCUIT FOR SOLENOID-ACTUATED ELECTRIC HAND TOOL

Hans Weigert, Ridgewood, N.J., assignor to Electro-Matic Staplers, Inc., Saddle Brook, N.J.

Continuation-in-part of Ser. No. 584,735, Feb. 29, 1984, abandoned. This application Apr. 16, 1984, Ser. No. 600,398

Int. Cl.⁴ B25C *5/00*; H02P *1/18*

U.S. Cl. 307—140 **10 Claims**



1. In a trigger switch circuit used in an electric hand tool of the type having a casing, a manually actuated trigger, and electrical driving means, the circuit comprising input leads to be coupled to a source of AC power, a mechanical switch actuated by said trigger, and electronic circuit means coupled to said input leads, said switch, and said electrical driving means, said electronic circuit means providing a burst of power to the electrical driving means when said switch is actuated by said trigger, the circuit means providing a small pilot control current through said switch, said pilot control current controlling the power burst to said driving means; the improvement wherein said circuit means is sensitive to a break in said pilot control current and is actuated by opening of said switch to deliver said power burst; and said switch is formed of a first and a second conductive member, the first member having a first flexible resilient conductive leaf fixed at one end and extending at another, free end thereof to be urged by said trigger; said second member including a second resilient conductive leaf fixed at one end and having a bent-in member at a free end thereof with the bent-in member having a sharp point as its terminus contacting a side of the first flexible resilient conductive leaf, whereby when the first conductive member is moved in one direction by actuation of said trigger, the switch opens, and when the trigger releases the first conductive member, the resilience of the first conductive leaf moves the latter in the opposite direction and brings the two members back into contact to close the switch, and flexing of the first and second leaves moves the terminus of said bent-in member along the side of the first conductive leaf with the pointed terminus being operative to scratch away corrosion from an area of contact between said first and second members.

4,556,804

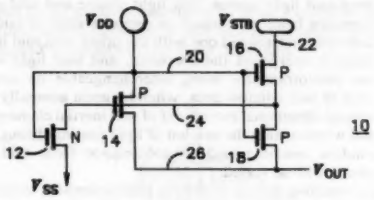
POWER MULTIPLEXER SWITCH AND METHOD

B. Chris Dewitt, Austin, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Nov. 17, 1983, Ser. No. 552,933

Int. Cl.⁴ H03K *17/693*

U.S. Cl. 307—296 R **12 Claims**



1. A power multiplexer switch for alternatively coupling a supply or standby voltage line to an output voltage line comprising:

first switching means for coupling an intermediate node to a common voltage line;

second switching means responsive to said first switching means for coupling said supply voltage line to said output voltage line; and

third and fourth switching means connected to said intermediate node for coupling said standby voltage line to said output voltage line when a voltage on said standby voltage line exceeds that on said supply voltage line.

4,556,805

COMPARATOR CIRCUIT HAVING HYSTERESIS VOLTAGE SUBSTANTIALLY INDEPENDENT OF VARIATION IN POWER SUPPLY VOLTAGE

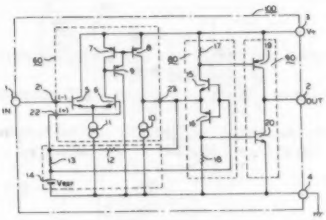
Masashi Shoji, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Sep. 6, 1983, Ser. No. 529,880

Claims priority, application Japan, Sep. 7, 1982, 57-155466

Int. Cl.⁴ H03K *5/153*

U.S. Cl. 307—359 **14 Claims**

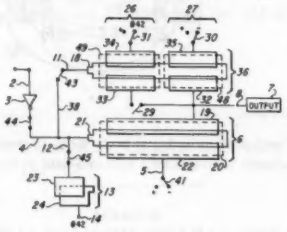


1. A comparator circuit comprising an amplifier having first and second input ends and an output end and comparing an input signal voltage supplied to said first input end with a threshold voltage supplied to said second input end to generate a first signal of a higher voltage at said output end or a second signal of a lower voltage at said output end, a voltage-clamping circuit clamping the voltage at said output end of said amplifier at a first stabilized voltage in response to said first signal and that at a second stabilized voltage in response to said second signal, and a feedback circuit generating a first feedback voltage corresponding to said first stabilized voltage and a second feedback voltage corresponding to said second stabilized voltage to supply one of said first and second feedback voltages to said second input end of said comparator as said threshold voltage.

4,556,806
GATE ALTERABLE OUTPUT BUFFER

Pravin T. Amin, Houston, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 376,319, May 10, 1982. This application Nov. 21, 1984, Ser. No. 673,823
Int. Cl.[4] H03K *19/094, 17/687*
U.S. Cl. 307—475 10 Claims

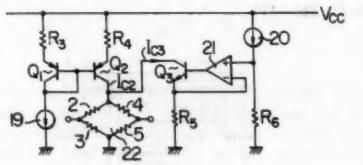


1. An electronic output buffer comprising:
an input terminal for receiving signals;
an output terminal;
a clock signal terminal for receiving clock signals;
a power supply means having a first power terminal for supplying electric power having a first polarity and a second power terminal for supplying electric power having a second polarity opposite to said first polarity;
an inverting means having an inverter input terminal connected to said input terminal and an inverter output terminal;
a first field effect device (**26**) having a first source, a first gate and a first drain;
a second field effect device (**27**) having a second source, a second gate connected to said first gate and a second drain connected to said output terminal;
a third field effect device (**6**) having a third source connected to said output terminal, a third gate and a third drain;
a first connection means (**31**) selectable in manufacture for connecting said first source to either said first power terminal or said clock signal terminal;
a second connection means (**30**) selectable in manufacture for connecting said second source to either said first power terminal or said second power terminal;
a third connection means (**29**) selectable in manufacture for connecting or disconnecting said first drain to said output terminal;
a fourth connection means (**43***a*) selectable in manufacture for connecting or disconnecting said first gate to said third gate;
a fifth connection means (**43***b*) selectable in manufacture for connecting or disconnecting said first gate to said input terminal;
a sixth connection means (**41**) selectable in manufacture for connecting said third drain to either said first power terminal or said second power terminal; and
a seventh connection means (**44**) selectable in manufacture for connecting or disconnecting said inverter output terminal to said third gate
whereby the electronic output buffer is configurated to operate as a push-pull, pull low or pull high output buffer by the connection thereto with the first, second and third field effect device.

4,556,807
PRESSURE TRANSDUCER WITH TEMPERATURE COMPENSATION CIRCUIT

Kazuji Yamada; Hideo Sato, both of Hitachi; Kazuo Kato, Ibaraki; Takao Sasayama, Hitachi; Kanji Kawakami, Katsuta, and Ryosaku Kanzawa, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 11, 1983, Ser. No. 522,227
Claims priority, application Japan, Aug. 16, 1982, 57-141067
Int. Cl.[4] G01L *9/06*
U.S. Cl. 307—491 5 Claims

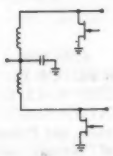


1. A pressure transducer comprising:
a semiconductor substrate including a thin diaphragm;
a pressure sensor portion including a bridge connection of gage resistors formed on said diaphragm;
a first current source connected to said pressure sensor portion and making up a power supply for driving said pressure sensor portion, said first current source supplying a current equivalent to the sum of a current substantially proportional to the absolute temperature and a current independent of temperature; and
a second current source for sinking the current substantially proportional to the temperature characteristic of said gage resistors from said first current source.

4,556,808
MICROWAVE MONOLITHIC SPOT FET SWITCH CONFIGURATION

Robert P. Coats, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Jun. 3, 1982, Ser. No. 384,379
Int. Cl.[4] H03K *17/687, 17/56;* H01P *1/10*
U.S. Cl. 307—571 14 Claims



1. A microwave switch, for selectively switching microwave energy at approximately a known operating frequency between an input line and either a first or a second output line, said input and first and second output lines all having a first impedance, said switch comprising:
first and second FETs, each said FET being shunt connected to a respective one of said output lines;
first and second quasi-lumped inductors, each said respective inductor being connected between a respective one of said FETs and said input line; and
a capacitor connected to said input line;
wherein the values of said capacitor, of said quasilumped inductances, and of the source/drain capacitances of said FETs are selected to impose a phase shift of approximately 90° between said FET and said input line at said operating frequency.

4,556,809

COMBINATION SYNCHRONOUS AND ASYNCHRONOUS ELECTRIC MOTOR

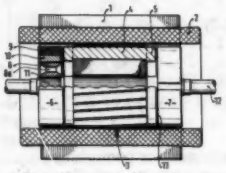
Achim Beisse, Oberboihingen; Helmut Härer, Remseck; Adolf Mohr, Bühlertal, and Siegfried Schustek, Immenstaad, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Continuation of Ser. No. 520,553, Aug. 5, 1983, abandoned. This application May 22, 1985, Ser. No. 736,981

Claims priority, application Fed. Rep. of Germany, Aug. 6, 1982, 3229351

Int. Cl.[4] H02K *16/00*

U.S. Cl. 310—114 **6 Claims**



1. A combination synchronous and asynchronous electric motor having an annular laminated stator core provided with a plural-phase winding thereon and devoid of other windings and a rotary shaft coaxial with said stator core, and further comprising:

a compound rotor structure fixedly mounted on said shaft composed of two substantially identical rotors (6,7) each having arcuate permanent magnet elements (9) mounted on a magnetically soft yoke (10) carried on a nonmagnetic hub (8) affixed to said shaft having passages (8*a*) pierced therethrough for passage of cooling air, and a third rotor (4) located between said substantially identical rotors and having a laminated core and a short-circuiting squirrel-cage conductor configuration mounted on said core, said core being affixed to said rotor shaft, gaps (13) for cooling air being provided between said third rotor (4) and said substantially identical rotors (6,7),

whereby said third rotor contributes starting torque and said identical rotors contribute speed synchronization and running torque when said stator winding is electrically energized to cause the machine to operate as a motor.

4,556,810

HYSTERESIS MOTOR ROTOR HAVING CYLINDRICAL SHAPE WITH REDUCED WALL THICKNESS OUTSIDE STATOR REGION

Horst Kasper, Geilenkirchen, and Pritsch Eckhard, Jülich-Koslar, both of Fed. Rep. of Germany, assignors to Uranit GmbH, Jülich, Fed. Rep. of Germany

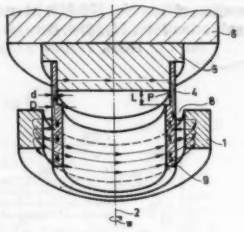
Filed Sep. 1, 1983, Ser. No. 528,636

Claims priority, application Fed. Rep. of Germany, Sep. 4, 1982, 3232914

Int. Cl.[4] H02K *1/06, 49/04*

U.S. Cl. 310—256 **4 Claims**

1. A motor rotor for use with a hysteresis motor in combination with a centrifuge rotor having a hub for continuously rotating the centrifuge rotor, wherein the motor has a stator with an axial length and the motor rotor has a region coextensive with the stator, said motor rotor comprising: a hollow cylindrical body made of a magnetizable material, having one end directly and firmly connected to said hub and having a wall with a first thickness in said region that is coextensive with the stator and a second thickness, smaller than the first thickness, which is outside of said region that is coextensive with the stator and which is in the region of the connection of said cylindrical body with said hub, the point of transition from the first thickness to the second thickness of said wall being a predetermined distance from the nearest point of contact of



said hub with said cylindrical body so as to increase the magnetic resistance between said hub and said cylindrical body.

4,556,811

COIL UNIT AND COIL FORM FOR ELECTRICAL MACHINES

Howard F. Hendricks, Lansdale, Pa., assignor to Electric Indicator Company, Inc., Norwalk, Conn.

Continuation of Ser. No. 111,125, Jan. 10, 1980, abandoned. This application Oct. 26, 1984, Ser. No. 665,082

Int. Cl.[4] H02K *1/22*

U.S. Cl. 310—266 **13 Claims**

1. A coil form and coils for use in electrical machines, comprising:

(a) a longitudinally extending tubular member;

(b) a plurality of winding locating serrations arranged about the circumference of each of the first and second longitudinal ends of said member;

(c) each of said serrations including a first and a second surface, said first surface being arranged angularly at an acute angle in a range of from 10° to 30° with respect to a plane extending through and normal to the axis of said tubular member, said second surface being arranged angularly at an acute angle with respect to said first surface, and said angularly arranged first surface having sufficient length to support a plurality of winding turns in side by side relation;

(d) a plurality of coils wound upon said tubular member, each coil including a winding extending from the first surface of a starting serration at one end of the tubular member and making at least two passes about the outer and inner surfaces of the tubular member before returning to the first surface of the starting serration, each pass extending diagonally from the first surface of a serration at one end of the tubular member over one of the outer or inner surfaces of the tubular member to the first surface of an angularly displaced serration at the other end of the tubular member and then diagonally over the other of the outer or inner surfaces of the tubular member to the first surface of an angularly displaced serration at the one end of the tubular member, and said first surface of each serra-

tion supporting a plurality of winding turns in side by side relation.

4,556,812

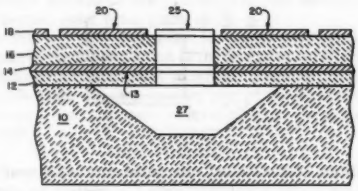
ACOUSTIC RESONATOR WITH AL ELECTRODES ON AN ALN LAYER AND USING A GAAS SUBSTRATE

Gerald R. Kline, and Kenneth M. Lakin, both of Ames, Iowa, assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Division of Ser. No. 541,608, Oct. 13, 1983, Pat. No. 4,502,932. This application Jul. 18, 1984, Ser. No. 632,165

Int. Cl.⁴ H01L *41/08*

U.S. Cl. 310—324 **9 Claims**



1. An acoustic wave resonator comprising:
two aluminum electrodes, essentially parallel to one another,
an excitation layer of AlN between said electrodes, and
a shielding layer of AlN supported on the exterior surface of one electrode, said electrodes and AlN layers configured in a shelf-like structure supported by a GaAs substrate at its periphery.

4,556,813

CAST METAL SONIC TRANSDUCER HOUSING

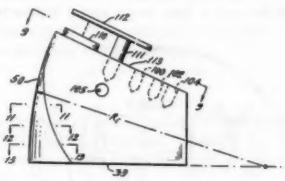
Joseph Baumoel, 107 Columbia Dr., Jericho, N.Y. 11753

Division of Ser. No. 542,691, Oct. 17, 1983. This application Jul. 16, 1984, Ser. No. 631,222

The portion of the term of this patent subsequent to Aug. 28, 2001, has been disclaimed.

Int. Cl.⁴ H01L *41/08*

U.S. Cl. 310—334 **21 Claims**



1. A transducer housing for conducting sonic energy from a source of sonic energy to an output surface; said transducer housing consisting of a cast metal body.

4,556,814

PIEZOELECTRIC ULTRASONIC TRANSDUCER WITH POROUS PLASTIC HOUSING

Toshiharu Ito; Eiji Ozeki, and Kozo Okada, all of Nagoya, Japan, assignors to NGK Spark Plug Co., Ltd., Japan

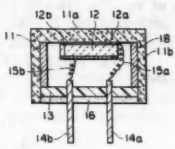
Filed Oct. 10, 1984, Ser. No. 659,281

Claims priority, application Japan, Feb. 21, 1984, 59-24346; Feb. 24, 1984, 59-26487; Apr. 6, 1984, 59-50347

Int. Cl.⁴ H01L *41/08*

U.S. Cl. 310—334 **9 Claims**

1. An ultrasonic transducer comprising:
an oscillation housing member having a cylindrical side plate and a wave transmitting and receiving top plate provided at one end of said side plate;
a piezoelectric element integrally bonded to the inside wall of said top plate; and



electrodes arranged on said piezoelectric element so that ultrasonic waves may be generated from said top plate when an electric field is applied to said electrodes and/or an electric output is delivered from said electrodes when said top plate receives ultrasonic waves, said top plate being formed of a porous plastic material.

4,556,815

PIEZOELECTRIC DEVICE FOR DETECTING STOPPAGE OF A NOZZLE

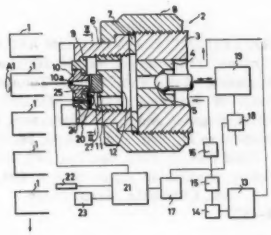
Mosaburo Ohhashi, No. 505, 24-55, Takanawa 4-chome, Minato-ku, Tokyo, and Hiroshi Yanai, 14, Takatsu-ku, Kawasaki-shi, Kanagawa-ken, both of Japan

Filed Jun. 29, 1984, Ser. No. 626,406

Claims priority, application Japan, Jun. 30, 1983, 58-117116

Int. Cl.⁴ H01L *41/08*; B05B *1/30*

U.S. Cl. 310—338 **2 Claims**

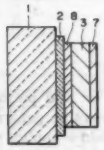


1. In combination a discharge head having a discharge nozzle for pressurized fluids and a shut-off valve and means for controlling the actuation of the shut-off valve; said discharge nozzle having a discharge port; a fluid flow path through said discharge head including a fluid inlet conduit and a chamber communicating with said conduit and a fluid passage communicating with both said chamber and the discharge port of said discharge nozzle; said chamber being in a portion of said fluid flow path where the pressure of said fluid when the discharge nozzle is operating normally is less than that at which the fluid is delivered to said discharge head; said shut-off valve being seated in said conduit and actuator means holding said shut-off valve in normally open position; a piezo-electric transducer type pressure sensor seated in and exposed to the fluid in said chamber; signal transmission means interconnecting said sensor with said actuator means for actuating said actuator means to close said shut-off valve upon detection by the sensor of an increase of fluid pressure of the type characteristic of a blockage of fluid flow through the nozzle.

4,556,816
PHOTOELECTRIC DEVICE

Yoshinori Imamura, Hachioji; Saburo Ataka, Tokyo; Yukio Takasaki, Hachioji; Yasuo Tanaka, Kokubunji; Tadaaki Hirai, Koganei, and Eiichi Maruyama, Kodaira, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 216,495, Dec. 15, 1980, abandoned.
This application Jul. 5, 1983, Ser. No. 510,910
Claims priority, application Japan, Dec. 14, 1979, 54-161549
Int. Cl.[4] H01J *31/00, 31/26*
U.S. Cl. 313—366 8 Claims

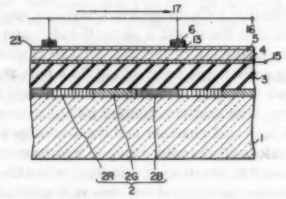


1. In a photoelectric device having at least a signal electrode, and an amorphous photoconductor layer whose principal constituent is silicon and which contains at least 5 atomic-% to at most 50 atomic-% of hydrogen as an indispensable constituent element, the amorphous photoconductor layer being disposed close to the signal electrode; the photoelectric device being characterized in that a thin layer is interposed between said signal electrode and said amorphous photoconductor layer, said thin layer being made of an inorganic material consisting essentially of at least one compound selected from the group consisting of an oxide of at least one element selected from the group consisting of Si, Ba, Ta, Ti and Al, a nitride of an element selected from the group consisting of Si and Ta, and a halide of an element selected from the group consisting of Li and Mg.

4,556,817
PHOTOELECTRIC CONVERSION APPARATUS

Chushirou Kusano, Tokorozawa; Sachio Ishioka, Tokyo; Yoshinori Imamura, Kanagawa; Yukio Takasaki; Hirofumi Ogawa, both of Hachioji; Tatsuo Makishima, Hachioji; Tadaaki Hirai, Koganei, and Eiichi Maruyama, Kodaira, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 2, 1983, Ser. No. 547,962
Claims priority, application Japan, Nov. 4, 1982, 57-192476
Int. Cl.[4] H01J *29/45, 31/26*
U.S. Cl. 313—371 14 Claims

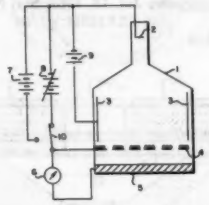


1. A photoelectric conversion apparatus comprising a target including a transparent substrate, a transparent conductive film formed on said transparent substrate, a photoconductive layer formed on said transparent conductive film, a secondary electron emitting layer formed on said photoconductive layer, and stripe electrodes formed on said secondary electron emitting layer.

4,556,818
INSULATING CRYSTALS FOR COATING ON A METAL MESH OF A STORAGE TUBE

Lyuji Ozawa, Glencoe, Ill., assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Dec. 29, 1982, Ser. No. 454,354
Claims priority, application Japan, Dec. 29, 1981, 56-212847
Int. Cl.[4] H01J *31/38*
U.S. Cl. 313—395 8 Claims

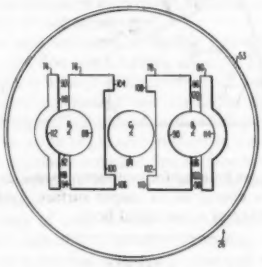


1. Insulating crystals which are coated on a metal mesh of a storage tube having a voltage means for creating an electric field therein, said crystals controlling the flow of flood electrons passing through said metal mesh and exhibiting a hysteresis effect with respect to said passage of flood electrons through said metal mesh, wherein said crystals have a clean surface, contain recombination centers of mobile electrons and holes which are generated therein by the irradiation of an electron beam thereon, and exhibit a persistent polarization when said electric field created by said voltage means has been applied across said crystals, and wherein said persistent polarization is depolarized when said persistently polarized crystals are irradiated by a writing electron beam.

4,556,819
COLOR PICTURE TUBE HAVING INLINE ELECTRON GUN WITH COMA CORRECTION MEMBERS

Hsing-Yao Chen, Landisville, and Richard H. Hughes, Lancaster, both of Pa., assignors to RCA Corporation, Princeton, N.J.

Filed Dec. 13, 1983, Ser. No. 560,794
Int. Cl.[4] H01J *29/76*
U.S. Cl. 313—413 4 Claims



1. In a color picture tube having an inline electron gun for generating and directing three inline electron beams, comprising a center beam and two outer beams, along initially coplanar paths toward a screen of said tube, wherein the beams pass through a deflection zone adapted to have two orthogonal magnetic deflection fields established therein, a first of said fields causing deflection of the beams perpendicular to the inline direction of said beams, and a second of said fields causing deflection parallel to the inline direction of said beams, the improvement comprising

said electron gun including four magnetically permeable members located near the exit of said electron gun in a fringe portion of said deflection zone, a first and a second of said members being located between the center beam path and a first and a second outer beam path, respectively, and a third and a fourth of said members being spaced from said first and second members, respectively, and being located on the outside of the respective outer beam paths,

said first and third members and said second and fourth members having means for bypassing a part of the fringe portion of the first of the two orthogonal magnetic deflection fields, at said members, around the respective outer beam paths, while allowing another part of the same fringe portion, at said members, to pass through the respective outer beam paths, and

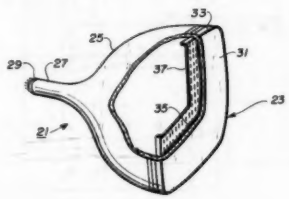
said first and second members having means for bypassing a part of the fringe portion of the first of the two orthogonal deflection fields, at said members, around the center beam path while allowing another part of the same fringe portion, at said members, to pass through the center beam path.

4,556,820

IMAGE DISPLAY INCLUDING A LIGHT-ABSORBING MATRIX OF ZINC-IRON SULFIDE

Robert P. Thompson, Millersville, Pa., assignor to RCA Corporation, Princeton, N.J.

Filed Dec. 27, 1983, Ser. No. 565,284
Int. Cl.[4] H01J *29/28*
U.S. Cl. 313—470 **7 Claims**



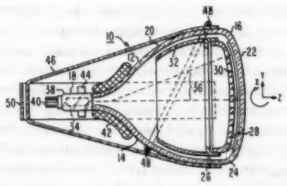
1. An image display including a viewing screen comprising spaced elemental image areas and a light-absorbing matrix adjacent said spaced areas, said matrix consisting essentially of crystalline zinc-iron sulfide particles.

4,556,821

COLOR IMAGE DISPLAY SYSTEM HAVING AN IMPROVED EXTERNAL MAGNETIC SHIELD

John C. Cooper, Lititz, Pa., assignor to RCA Corporation, Princeton, N.J.

Filed Mar. 15, 1984, Ser. No. 590,036
Int. Cl.[4] H01J *1/52*
U.S. Cl. 315—8 **10 Claims**



1. In a color image display system including:

a color picture tube having an evacuated envelope comprising a panel portion enclosing a display screen, a neck portion and a funnel portion connecting said panel portion and said neck portion;

a shadow mask frame assembly disposed within said envelope in proximity to said display screen;

an internal magnetic shield interconnected to said shadow mask frame assembly;

an electron gun assembly, mounted along a longitudinal axis in said neck portion, for producing a plurality of electron beams;

a deflection yoke assembly encircling adjoining segments of said neck and funnel portions for developing deflection fields which permit scanning of a display raster on said screen; and

a plurality of neck components disposed around said neck portion, the improvement comprising;

an external magnetic shield including at least one strap-like member having a substantially U-shaped configuration attached to said envelope, said shield being disposed along opposite sides of said funnel and neck portions and extending across said longitudinal axis behind said neck portion for shunting magnetic fields from said tube to minimize the effect of the magnetic fields on said electron beams, said shield being spaced from and external to said deflection yoke assembly and said neck portion, said shield being shaped to provide access to said deflection yoke assembly and said neck components to permit adjustment thereof without removing said shield.

4,556,822

MOUNTING STRUCTURE AND RELATED METHOD BOTH FOR A MULTI-FILAMENT INCANDESCENT LAMP

Edwin J. Lohrey, Euclid, and Timothy C. Cho, Mayfield Hts., both of Ohio, assignors to General Electric Company, Schenectady, N.Y.

Filed May 7, 1984, Ser. No. 607,838
Int. Cl.[4] H01J *7/44*
U.S. Cl. 315—67 **13 Claims**

1. In a multi-filament incandescent lamp adapted to operate at different levels of illumination comprising an outer envelope sealed and connected to an electrically conductive screw-in base, said lamp further comprising a minor and a major both spatially disposed and supported within said outer envelope by an improved mounting stem structure comprising:

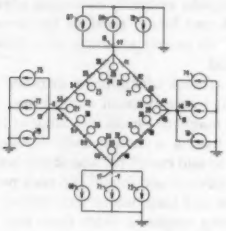
a three-pillar portion stem having inner and outer lead-in wires extending through each of the three pillar portions with one end of each of said outer lead-in wires appropriately connected to said electrically-conductive screw-in base, said inner lead-in wires each having a desired configuration with at least one reverse bend for providing stability for mounting said minor and major filaments, one of said inner lead-in wires having at least two hooked bends for respective clamp connections to one end of each of said minor and major filaments, the other two inner lead-in wires each having a hooked bend for a clamped connection to the other respective opposite ends of said minor and major filaments.

4,556,823

MULTI-FUNCTION CHARGED PARTICLE APPARATUS

John H. Keller, Newburgh, and James R. Winnard, Poughkeepsie, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 28, 1983, Ser. No. 518,229
Int. Cl.[4] H01J *7/24;* H05B *31/26*
U.S. Cl. 315—111.81 18 Claims



1. An ion beam system, including an ion source, adapted to project a high current ion beam along a path from aid ion source toward a target, said ion beam system comprising:

first means for focusing in a first direction the ion beam exiting said ion source;

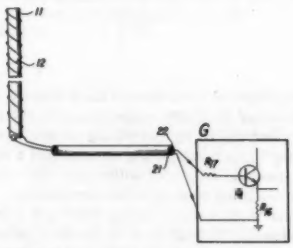
second means for focusing in a second direction the ion beam exiting said first means and for simultaneously scanning such beam across said target, said second means comprising an open-ended substantially box-shaped structure, each of the four sides of said substantially box-shaped structure formed of spaced metallic conductors, adjacent pairs of said metallic conductors connected by resistive elements, said substantially box-shaped structure terminated at the four corners by two pairs of conductors with one conductor in each corner.

4,556,824

LIGHT-ADJUSTMENT AND SWITCH STRUCTURE FOR ARTISTIC TABLE LAMPS

Hsiang T. Cheng, 2F, No. 185, Nan Ya W Rd., Sec. 2, Pan Chiao City, Taipei Hsien, Taiwan

Filed Feb. 14, 1984, Ser. No. 579,935
Int. Cl.[4] H05B *37/02*
U.S. Cl. 315—362 3 Claims



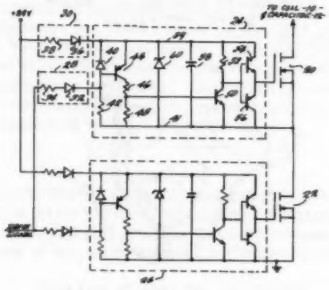
1. A light adjustment and switch structure for Artistic Table Lamps, comprising a metal induction plate, demagnetizing wires and an operational circuit; wherein the induction plate without any specific limits imposed on its length and width, is made in a proper shape and placed on the inner wall of the external casing of the table lamp stand in a position very close to the table lamp stand, and a demagnetizing wire is wound externally around the induction plate, of which the connection line between the induction plate and the input end of the operational circuit is a core line (cable), and a demagnetizing wire is wrapped externally around this core line (cable) and is connected to the grounding end of the operational circuit, wherein the voltage output line of the operational circuit is connected to the LAMP (bulb) of a table lamp by two core lines, a demagnetizing wire is wrapped around these core lines (cable) and is connected to the grounding line of the operational circuit; whereby the entire external surface of the table lamp stand is provided as a tough induction surface, and this touch induction surface is suitably made of a material low in induction coefficient such as ceramics, pottery, marble, glass, wood, plastics, acrylics . . . etc.

4,556,825

SWITCHING CIRCUIT

Christopher L. Thomas, Harvest, Ala., assignor to Intergraph Corporation, Huntsville, Ala.

Filed Sep. 9, 1983, Ser. No. 531,271
Int. Cl.[4] H01J *29/70*
U.S. Cl. 315—408 17 Claims



1. A deflection circuit for a television comprising:

a deflection coil;

means for energizing said coil;

switch means, connected in a circuit with said coil and said energizing means for controlling the energization of said coil, said switching means including first and second semiconductor switching elements each having first and second power terminals, said second power terminal of said first semiconductor switching element being connected to said first power terminal of said second semiconductor switching element, each of said semiconductor switching elements also having a control terminal;

first control means, coupled to said first switching element control terminal and responsive to a control signal, for operating said first switching element;

second control means, coupled to said second switching element control terminal and responsive to said control signal, for operating said second switching element; and

semiconductor blocking means, having an input and an output coupled to said first control means, for passing said control signal to said first control means and for allowing a voltage on said control terminal of said first semiconductor switching element to follow a voltage on said second terminal of said first semiconductor switching element above said control signal while preventing voltages larger than a predetermined value from passing from said output of said input.

4,556,826

INCHING SUPPLY TORQUE CONTROL

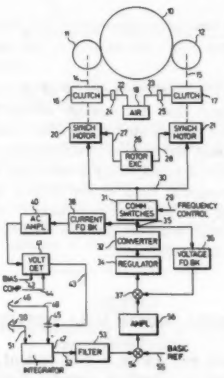
Ronald C. Trussler, Peterborough; Andrew C. Stevenson, Bailieboro, and Peter D. Eastcott, Peterborough, all of Canada, assignors to Canadian General Electric Company Limited, Toronto, Canada

Continuation-in-part of Ser. No. 556,907, Dec. 1, 1983, abandoned, which is a continuation-in-part of Ser. No. 470,443, Feb. 28, 1983, abandoned. This application Aug. 22, 1984, Ser. No. 643,303

Claims priority, application Canada, Feb. 4, 1983, 420981

Int. Cl.[4] H02P *1/56, 7/747*

U.S. Cl. 318—92 7 Claims



1. An electrical control for inching a drive system having a load driven by at least one three-phase synchronous motor, each synchronous motor having a stator and a rotor, each stator having stator windings and each rotor having field windings, comprising

means for applying direct current excitation to the field winding on said rotor of each said synchronous motor,

a controllable source of direct current,

commutating means receiving from said controllable source of direct current a supply of direct current power and providing low frequency stepped alternating current power to the stator winding of each said synchronous motor for inching the motor,

the direct current power provided by said controllable source of direct current having an alternating current component which increases as the applied motor torque exceeds the load torque plus frictional torque,

means for determining the level of the alternating current component and for providing a control signal representing the determined level,

means for applying said control signal to said controllable source of direct current to reduce the level thereof whereby the applied motor torque decreases to approach the load torque plus frictional torque required and said alternating current component reduces.

4,556,827

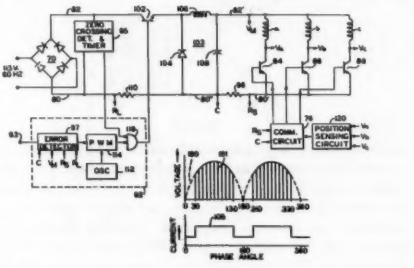
LAUNDERING APPARATUS, METHOD OF OPERATING A LAUNDRY MACHINE, CONTROL SYSTEM FOR AN ELECTRONICALLY COMMUTATED MOTOR, METHOD OF OPERATING AN ELECTRONICALLY COMMUTATED MOTOR, AND CIRCUIT

David M. Erdman, Fort Wayne, Ind., assignor to General Electric Company, Fort Wayne, Ind.

Division of Ser. No. 141,267, Apr. 17, 1980, abandoned, which is a continuation-in-part of Ser. No. 77,656, Sep. 21, 1979, abandoned, which is a continuation-in-part of Ser. No. 802,484, Jun. 1, 1977, Pat. No. 4,169,990, which is a continuation-in-part of Ser. No. 729,761, Oct. 5, 1976, abandoned, which is a continuation-in-part of Ser. No. 482,409, Jun. 24, 1974, Pat. No. 4,005,347. This application Jul. 21, 1982, Ser. No. 400,214

Int. Cl.[4] H02M *1/08, 7/12;* H02P *6/02*

U.S. Cl. 318—254 50 Claims



1. A method of operating a DC motor energized from an AC source comprising the steps of:

rectifying the output of the AC source to provide a full wave rectified sinusoidal voltage;

converting the full wave rectified sinusoidal voltage into voltage pulses having a high frequency with respect to the frequency of the full wave rectified sinusoidal voltage so as to provide an effective voltage to the motor; and

limiting the voltage pulses to the time interval in each half cycle of the full wave rectified sinusoidal voltage during which the full wave rectified sinusoidal voltage exceeds the effective voltage.

21. Laundry apparatus comprising:

means operable generally in a laundering mode for agitating fluid and fabrics to be laundered therein and operable generally in a spin mode for thereafter spinning the fabrics to effect centrifugal displacement of fluid from the fabrics;

an electronically commutated motor including a stationary assembly, a multi-stage winding arrangement associated with said stationary assembly and having a plurality of winding stages adapted to be commutated in a plurality of preselected sequences, and rotatable means rotatably associated with said stationary assembly and arranged in selective magnetic coupling relation with said winding stages for driving said agitating and spinning means in the laundering mode operation and in the spin mode operation thereof upon the commutation of said winding stages;

power supply means for supplying a full wave rectified sinusoidal voltage;

means for producing pulses of the full wave rectified sinusoidal voltage during a single continuous interval in each half cycle of the full wave rectified sinusoidal voltage, for applying them to said winding stages in one of the preselected sequences to commutate said winding stages and effect the spin mode operation of said agitating and spinning means and for applying the voltage pulses to said winding stages in both the one preselected sequence and another preselected sequence to effect the laundering mode operation of said agitating and spinning means, the voltage pulses having a frequency which is high with

respect to the frequency of the full wave rectified sinusoidal voltage; and

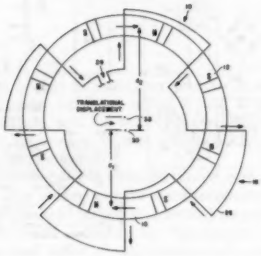
means for width modulating the voltage pulses to produce substantially rectangular current pulses flowing in said electronically commutated motor, each of the rectangular current pulses occurring during the single continuous interval in each half cycle of the full wave rectified sinusoidal voltage.

4,556,828

ELECTRIC MOTOR ADAPTED TO PERMIT TRANSLATIONAL MOTION BETWEEN FIELD AND ARMATURE

Thomas W. Thompson, Hopkinton Village, N.H., assignor to Sanders Associates, Inc., Nashua, N.H.

Filed Nov. 2, 1983, Ser. No. 548,176
Int. Cl.[4] H02K *29/02, 5/24*
U.S. Cl. 318—254 **27 Claims**



8. An electric motor comprising:

(a) an armature comprising an electrical conductor adapted to be connected to an electrical source, said armature being wound in a serpentine path to form interconnected radial conductor working portions lying substantially along radius lines passing through the center point of the armature so as to have the current flow in opposite directions in adjacent ones of said radial conductors;

(b) magnetic field flux producing means for producing a ring of magnetic flux comprising a plurality of alternating magnetic polarities, the flux lines of said magnetic flux being normal to the plane of said armature, said ring of magnetic flux being disposed to cross over only said radial conductors,

(c) wherein the center of said armature and the center of said magnetic field flux producing means are translationally movable with respect to each other.

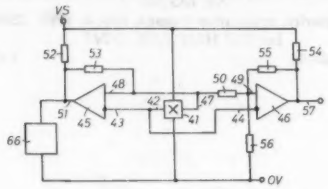
4,556,829

DRIVE ARRANGEMENT FOR SIGNAL PROCESSING EQUIPMENT

Johann von der Heide, Schramberg, Fed. Rep. of Germany, assignor to Papst-Motoren GmbH & Co. K.G., St. Georgen, Fed. Rep. of Germany

Filed Jun. 6, 1984, Ser. No. 617,629
Int. Cl.[4] H02P *6/02*
U.S. Cl. 318—254 **14 Claims**

1. Drive for signal processing equipment, particularly disk storage devices, comprising a direct drive brushless D.C. motor having a rotor with a permanent magnet formed of at least two pairs of poles, means providing a field strength increase adjacent one of the magnet poles and causing a flux discontinuity, at least one stationary magnetic field sensor for detection of rotor position, said sensor having an output signal with a zero position, said sensor being located in the field of the permanent magnet, a commutating signal generator stage, a commutating device controlled by the commutating signal generator stage, a stator winding electrically connected to the commutating device, the commutating signal generator stage being provided with a commutating comparator connected to the magnetic field sensor output, the commutating comparator having two switching points located close to the portion of the magnetic field sensor output signal that is not affected by the increased field strength, an index signal generator stage that generates one index signal per rotor rotation in response to the flux discontinuity, the index signal generator stage including an index comparator having first and second switching points, the



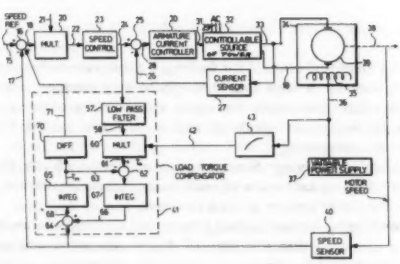
first of which is close to the portion of the magnetic field sensor output signal that corresponds to the field strength increase, the index comparator being also connected to the magnetic field sensor, the second switching point of the index comparator at least approximately coinciding with the zero crossing of the magnetic field sensor output signal, and the output pulse edge of the index comparator that occurs on exceeding the second switching point of the index comparator being taken as an index indicator.

4,556,830

SPEED CONTROLLER FOR MILL DRIVES AND THE LIKE

Charles L. Schwalm, and Walter A. Hill, both of Peterborough, Canada, assignors to Canadian General Electric Company Limited, Toronto, Canada

Continuation-in-part of Ser. No. 588,002, Mar. 9, 1984. This application Sep. 19, 1984, Ser. No. 651,945
Claims priority, application Canada, Mar. 31, 1983, 424992
Int. Cl.[4] G05B *5/00;* **H02D** *5/16*
U.S. Cl. 318—326 **3 Claims**



1. Speed control apparatus for a drive motor having an armature and a field winding, and having a power supply and a power source for providing current to said field winding and to said armature respectively, at least said power source being controllable, said apparatus having a first speed control portion with a first speed of response and a second speed control torque compensation portion with a second speed of response, said first speed control portion comprising

means for providing a first signal representing the difference between an input speed reference signal and an actual motor speed signal,

first integrating means for integrating said first signal and providing a second signal representing a desired current,

means connected to said first integrating means and said power source for providing a third signal representing the difference between said second signal and an actual current signal from said power source,

means responsive to said third signal for controlling said power source to provide a current which approaches said desired current,

said second speed control portion comprising,

means receiving said second signal and a signal representing field current and providing a fourth signal representing a model value of developed torque,

means for securing said fourth signal and a fifth signal representing a model value of load torque and providing as a sixth signal a difference signal representing net torque,

second integrating means for receiving said sixth signal and providing a seventh signal representing a model of motor speed,

means for receiving said seventh signal and said actual motor speed signal and providing an eighth signal representing the difference,

third integrating means for integrating said eighth signal to provide said fifth signal,

differentiating means for receiving said fifth signal and providing as a compensating speed signal a ninth signal, and

means applying said ninth signal to adjust said first signal with abrupt changes in load torque,

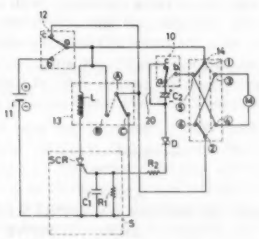
said second speed of response being faster than said first speed of response to provide for rapid adjustment in response to changes in load torque.

4,556,831

CIRCUIT ARRANGEMENT FOR ELECTRICAL TOOL WITH CLUTCH

Junshin Sakamoto, and Shigeru Shinohara, both of Katsuta, Japan, assignors to Hitachi Koki Company, Limited, Tokyo, Japan

Filed Jul. 11, 1984, Ser. No. 629,869
Claims priority, application Japan, Jul. 12, 1983, 58-127195
Int. Cl.⁴ H02K *23/68;* **F16D** *23/00*
U.S. Cl. 318—434 **10 Claims**



1. A circuit arrangement for an electrical tool with a clutch, comprising:

(a) a power switch for supplying a motor of said tool with electrical power;

(b) a limit switch responsive to said clutch, said limit switch assuming first and second states for selectively transmitting electrical power fed through said power switch;

(c) a switching circuit of self-holding type responsive to said limit switch for short-circulating said motor when said clutch is in a predetermined state, said switching circuit being powered through said power switch; and

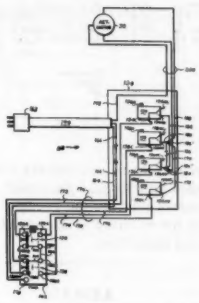
(d) means responsive to said limit switch for preventing said switching circuit from making a short circuit with respect to said motor, said means having a capacitor arranged to be charged through said limit switch.

4,556,832

CONTROL VALVE APPARATUS

John P. Rollins, Lancaster, S.C., assignor to Duff-Norton Company, Inc., Charlotte, N.C.

Filed Mar. 8, 1984, Ser. No. 587,669
Int. Cl.⁴ H02P *1/08;* **G05D** *3/00*
U.S. Cl. 318—467 **18 Claims**



1. Control valve apparatus comprising valve means movable between two operative positions and an intermediate inoperative position, a reversible electric motor, shaft means rotatable drivenly by said motor and operatively connected with said valve means for actuating movement thereof, and operating means for electrically controlling operation of said electric motor, said operating means including electrical circuit means for electrically connecting said electric motor with a source of electrical current for rotation of said shaft means in opposite direcitons and switch means in said electrical circuit means for selective manual actuation of said electric motor for rotation of said shaft means in said opposite directions from a centered position thereof wherein said valve means is in its said intermediate inoperative position, for automatically deactuating said electric motor from rotation of said shaft means at each of two moved positions thereof rotated from said centered position thereof respectivley in said opposite directions wherein said valve means is respectively in its said two operative positions, and for automatically actuating reverse operation of said electric motor upon cessation of manual actuation thereof for reverse rotation of said shaft means in return to said centered position.

4,556,833

NUMERICAL CONTROL DEVICE

Hajimu Kishi, Hino; Masaki Seki, Tokyo; Kunio Tanaka, and Takashi Takegahara, both of Hachioji, all of Japan, assignors to Fanuc Ltd., Minamitsuru, Japan

PCT No. PCT/JP82/00179, § 371 Date Jan. 17, 1983, § 102(e) Date Jan. 17, 1983, PCT Pub. No. WO82/04138, PCT Pub. Date Nov. 25, 1982
PCT Filed May 18, 1982, Ser. No. 460,244
Claims priority, application Japan, May 18, 1981, 56-074680
Int. Cl.⁴ G05B *19/00*
U.S. Cl. 318—567 **5 Claims**

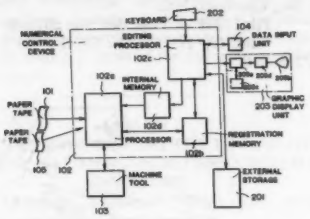
1. A numerical control device having a processor for executing control processing and controlling a machine tool on the basis of numerical control information, said numerical control device including:

external storage means for storing machining data corresponding to a plurality of shape patterns;

input means for inputting a part code identifying a shape pattern, machining conditions, and numerical values;

editing processor means, operatively connected to said external storage means and to said input means, for reading from said external storage means, machining data in accordance with the part code, and for creating numerical

control information based on said machining data, said numerical values and machining conditions entered from said input means; and



internal memory means, operatively connected to said editing processor and to daid processor, for storing said numerical control information created by said editing processor, and for entering said numerical control information into said processor.

4,556,834

NUMERICALLY CONTROLLED PATTERN CUTTING MACHINE FOR GLASS PANES

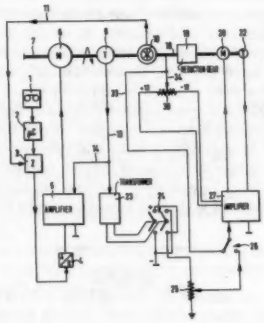
Heinz-Josef Reinmold, and Wilhelm Arnoldi, both of Aachen, Fed. Rep. of Germany, assignors to Saint-Gobain Vitrage, Courbevoie, France

Filed Jan. 13, 1983, Ser. No. 457,650

Claims priority, application Fed. Rep. of Germany, Jan. 22, 1982, 3201850

Int. Cl.[4] G05B *19/18*

U.S. Cl. 318—569 **6 Claims**



1. A numerically controlled machine, particularly a pattern cutting machine for a glass pane, having capability of use in controlling movement of a cross sled and a supported cutting tool relative to said glass pane comprising

(a) a drive motor including

(1) a drive motor output shaft adapted to be connected to said cross sled for driving said cross sled longitudinally along a first path in response to a drive signal representative of a theoretical program,

(b) means connecting said drive motor to a source of said drive signal,

(c) a pulse generator including

(1) a housing and

(2) a rotor within said housing, said rotor being connected to said drive motor output shaft for generating a signal which is representative of an actual position of said cross sled along said first path,

(d) a control motor including

(1) a control motor output shaft, said control motor output shaft being connected to said housing and operative to rotate said housing relative to said rotor either in the direction of movement of said rotor or in the opposite direction,

(e) means for comparing said actual position signal and set points of said drive signal, said comparison means located within said connection means, and

(f) means for controlling said control motor and said control motor output shaft to rotate said housing of said pulse generator at a rate proportional to the rate of rotation of said drive motor output shaft and position said housing of said pulse generator relative to said rotor either to extend or shorten said cutting pattern

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4,556,835

OPERATING MECHANISM FOR MOVABLE PARTS, ESPECIALLY FOR SLIDING ROOFS AND SLIDING/LIFTING ROOFS

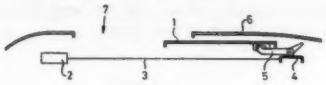
Wolfgang Vogel, Gauting, and Albert Zintler, Fürstenfeldbruck, both of Fed. Rep. of Germany, assignors to Webasto-Werk W. Baier GmbH & Co., Fed. Rep. of Germany

Filed Sep. 9, 1983, Ser. No. 530,714

Claims priority, application Fed. Rep. of Germany, Sep. 22, 1982, 3235053; Jul. 5, 1983, 3324107

Int. Cl.[4] G05B *1/06*

U.S. Cl. 318—663 **30 Claims**



1. An operating system for a movable part arranged for the selective closing or exposing of an opening, especially for sliding roofs and sliding/lifting roofs of motor vehicles, having a motor drive for the movable part and an actuating member for starting the drive when required, wherein the actuating member comprises a desired-value transmitter for selecting a desired position of the movable part and, with the motor drive, forms part of a control circuit which compares a position selected at the desired-value transmitter with a detected actual position of the movable part and adjusts the position of the movable part until the actual and desired positions of the movable part coincide, wherein the actuating member has a selector lever located in the normal field of vision of a person operating an apparatus of which said movable part is a component.

4,556,836

MULTIPHASE MOTOR DAMPING METHOD AND CIRCUIT ARRANGEMENT

Luciano Antognini, 67 Ave. Dala Gare, 1022 Chavannes-Près-Renens, Canton of Vaud, Switzerland, assignor to Societe Industrielle de Sonceboz S.A., Berne, Switzerland

Filed May 17, 1984, Ser. No. 611,302

Claims priority, application Switzerland, May 24, 1983, 2796/83

Int. Cl.[4] H02K *29/04*

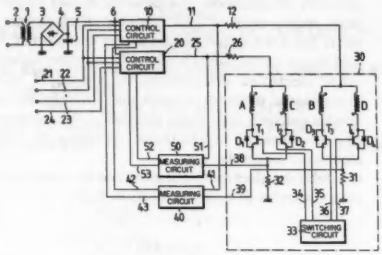
U.S. Cl. 318—696 **11 Claims**

1. A method of improving damping upon stopping of the movement of the rotor of a multiphase motor having a plurality of stator phase windings magnetically coupled to the rotor, through which windings currents are allowed to flow, comprising the steps of:

measuring the voltages induced in the stator windings by the movement of the rotor, and

imparting to said currents in the stator windings values depending on the measurements of the induced voltages,

the current applied to a cut-in phase winding being proportional to the algebraic sum of a reference value and a



magnitude proportional to the value of the induced voltage measured on that same winding.

4,556,837

ELECTRONIC CLINICAL THERMOMETER

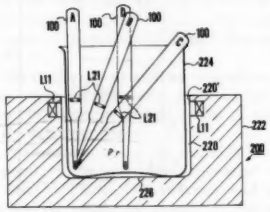
Susumu Kobayashi; Yutaka Muramoto; Hideo Ishizaka, all of Fujinomiya, and Yoshinori Ishii, Yamato, all of Japan, assignors to Terumo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 16, 1983, Ser. No. 475,858

Claims priority, application Japan, Mar. 24, 1982, 57-45630; Mar. 24, 1982, 57-45631

Int. Cl.⁴ G01K *5/00;* **H01M** *10/46;* **H02J** *7/00*

U.S. Cl. 320—2 **7 Claims**



1. A method of charging an electronic clinical thermometer having a secondary battery as a power supply, comprising the steps of:

(a) placing at least one electronic clinical thermometer into a cylindrical cavity in charger means having a power transmitting coil disposed around said cylindrical cavity, said at least one electronic clinical thermometer comprising a circuit for measuring and displaying the temperature of a portion being measured and; a secondary battery for supplying electric power to said circuit; rectifier means connected to said secondary battery; a power receiving coil connected to said rectifier means for inducing a voltage in response to a change in an external magnetic field applied to the power receiving coil; and a hollow bar-shaped casing housing said circuit, said secondary battery, said rectifier means, and said power receiving coil; said power receiving coil having a longer diameter extending substantially parallel to a longitudinal direction of said bar-shaped casing; and said power transmitting coil of said charger means comprising a set of at least three coils disposed around said cylindrical cavity of said charger means at substantially equal angular intervals;

(b) passing an alternating current through said power transmitting coil to enable said power transmitting coil to produce a revolving magnetic field for thereby generating a current flowing through said power receiving coil; and

(c) charging said secondary battery with said generated current through said rectifier means.

4,556,838

ELECTRONIC SWITCH

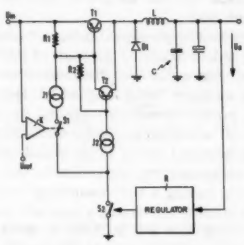
Georg Brasseur, Vienna, Austria, assignor to Friedmann & Maier Aktiengesellschaft, Hallein, Austria

Filed Oct. 4, 1983, Ser. No. 538,950

Claims priority, application Austria, Oct. 4, 1982, 3668/82

Int. Cl.⁴ G05F *1/56*

U.S. Cl. 323—285 **17 Claims**



1. An electronic switch comprising:

a first semiconductor element having power terminals, coupled between input and output terminals, and a control terminal;

a second semiconductor element, having power terminals and a control terminal and connected in Darlington configuration with said first semiconductor element;

first applying means, coupled to said output terminal, for applying a regulating signal to said control terminal of said second semiconductor element; and

second applying means for selectively applying said regulating signal to said control terminal of said first semiconductor element.

4,556,839

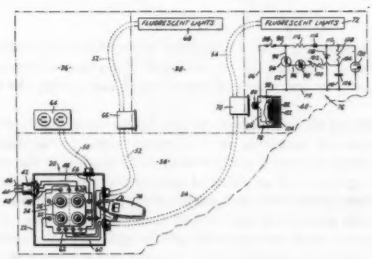
ELECTRICAL CIRCUIT IDENTIFICATION MEANS

David L. George, 352 Great Quarter Rd., Sandy Hook, Conn. 06482

Filed Mar. 28, 1984, Ser. No. 594,064

Int. Cl.⁴ G01R *19/00*

U.S. Cl. 324—66 **19 Claims**



1. A wholly self-contained electrical signalling means for energization by and for the purpose of distinguishing a particular one of a plurality of normally energized electric circuits leading to different accessible termination points in an electrical installation and originating at an energy distribution network that has means for opening said plurality of circuits and rendering the same dead, said circuits being normally energized and functioning, and said signalling means comprising, in combination:

(a) an electrical load,

(b) connection means for connecting said load to an accessible circuit termination point of one of said electric circuits, which termination point is disposed remote from said distribution network, said termination point being part of a predetermined one of said circuits that is to be identified at said network, and said connection means providing current to said load from said predetermined one circuit,

(c) a circuit control means activated and powered by current from said predetermined circuit, for periodically varying the current passing through said load, thereby to cause electrical current surges to flow in the predetermined circuit, and

(d) an inductively-coupled indicator adapted to be magnetically linked to any of the leads of said plurality of electrical circuits at the said distribution network,

(e) said indicator being adapted to respond to the surges in said predetermined circuit and to give an indication thereof, when magnetically coupled to the lead of said predetermined circuit at the distribution network,

(f) a housing carrying and enclosing said electrical load, said housing having a heat dissipating face,

(g) said housing containing a heat sink disposed at said heat-dissipating face and in thermal exchanging relation with the electrical load, so as to dissipate heat generated therefrom,

(h) said circuit control means being disposed substantially completely within said housing so as to minimize the possibility of fire, or shock or burn hazard to personnel handling the equipment.

4,556,840

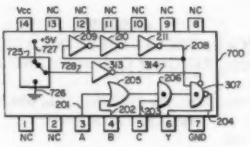
METHOD FOR TESTING ELECTRONIC ASSEMBLIES

Robert J. Russell, Boston, Mass., assignor to Honeywell Information Systems Inc., Waltham, Mass.

Filed Oct. 30, 1981, Ser. No. 315,594

Int. Cl.[4] G01R *15/12, 31/28*

U.S. Cl. 324—73 R **10 Claims**



1. A method of testing electronic assemblies comprised of a plurality of finished interconnected electronic components each having an internal transducer switch comrpising the steps of:

A. placing all said plurality of electronic components on said electronic assembly in a quiescent state by application without electrical contact with said plurality of electronic components of an external quiescence control signal not normally found in the operating environment of said electronic assemblies which will activate the internal transducer switch within each of said plurality of electronic components, said internal transducer switch when activated produces an internal quiescence control signal operative to cause each output stage of each of said plurality of electronic components to assume a high-impedance state;

B. selecting one of said plurality of electronic components as a target component to be tested in relative isolation from all the rest of said plurality of electronic components;

C. making said target component functional by removing said quiescence control signal;

D. applying test stimulus at one or more inputs of said target component;

E. measuring the results of said test stimulus at one or more outputs or said target component; and

going back to Step B and selecting an untested one of said plurality of electronic components as said target component, unless each of said plurality of electronic components has been tested as said target component; whereby said target components is tested in selective isolation from other electronic components connected to said target components' inputs or outputs, and whereby said testing is conducted with little or no analysis of the interconnection of said plurality of electronic components within said electronic assembly; and

whereby the electronic assembly can be tested by concatenating a series of component-level tests.

4,556,841

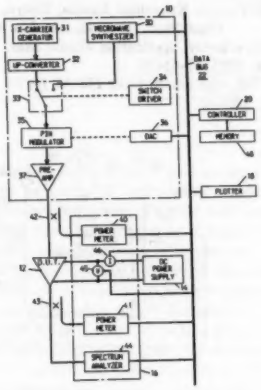
MEASUREMENT SYSTEM FOR CHARACTERIZING POWER AMPLIFIER AND OTHER DEVICE PERFORMANCE

Eric R. Carlson, Fair Haven, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Nov. 25, 1983, Ser. No. 554,949

Int. Cl.[4] G01R *27/00, 27/04*

U.S. Cl. 324—73 R **9 Claims**



1. A measurement system for characterizing the performance of a device comprising:

means capable of supplying predetermined test signals and for selectively applying any one of said predetermined test signals at an output terminal of the supplying means at any instant of time;

means responsive to an output test signal from the supplying and selectively applying means for modulating said output test signal to a predetermined output power level for transmission to an input of the device to be measured;

means capable of measuring the power level at the input and an output of the device being measured;

spectrum analyzing means coupled to the output of the device being measured for providing output signals indicative of a predetermined characteristic of the device in response to a test signal being applied to an input of the device being measured;

means for displaying measured characteristics of a device being measured; and

control means for generating selective control signals to the supplying and modulating means for controlling the selective application and the output power level, respectively, of the predetermined test signal being supplied to a device being measured and for interpreting the output signals from the power level measuring means and the spectrum

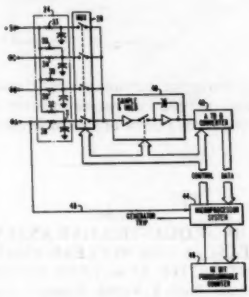
analyzing means for providing representative signals to the displaying means.

4,556,842

TRACKING FILTER FOR SENSING DC CONTENT IN AN AC WAVEFORM

Mark A. Rosswurm, Ada, Ohio, assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 26, 1983, Ser. No. 517,497
Int. Cl.[4] G01R *19/00*; H04B *15/00*; H02P *13/20*
U.S. Cl. 324—102 **16 Claims**



1. A method of determining the DC content in an AC waveform which is subject to frequency variations, said method comprising the steps of:

measuring a first instantaneous value of said AC waveform at a first point in a cycle of the AC waveform;

storing a signal representative of said first instantaneous value;

measuring the frequency of said AC waveform;

determining a time interval which is substantially equivalent to an exact odd number of half cycles of said AC waveform at the measured frequency;

measuring the instantaneous value of said AC waveform at a second point in the waveform separated by said time interval from said first point, wherein said instantaneous values of said AC waveform at said first and second points are equally and oppositely displaced from the mid-value of said AC waveform; and

generating a signal equal to the DC content of said AC waveform by averaging said first and second instantaneous values of the AC waveform.

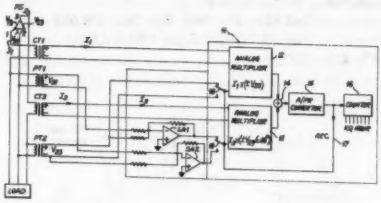
4,556,843

ELECTRONIC SOLID STATE Q-HOUR METER AND/OR COMBINATION Q-HOUR AND KILOWATT-HOUR METER

Miran Milkovic, Scotia, N.Y., and Anthony P. Bogacki, Chester, N.H., assignors to General Electric Company, Somersworth, N.H.

Filed Mar. 16, 1983, Ser. No. 475,952
Int. Cl.[4] G01R *21/06*
U.S. Cl. 324—107 **16 Claims**

1. An electronic solid state Q-hour meter is measuring leading and lagging VARS quantities of electric power consumed for a three-phase power supply having first, second and third phases for a defined range of power factor, said Q-hour meter comprising first and second time division/pulse width-amplitude modulated/analog multiplier circuit means; first and second current transformer means coupled to first and third phases of the three-phase power supply for deriving first and second analog current indicating signals indicative of the amplitude and phase of the currents flowing in said first and third phases, respectively; means for supplying said first and second analog current indicating signals to respective analog current input terminals to said first and second analog multiplier circuit means, respectively; first and second potential transformer means coupled across said first and second phases and said second and third phases of said three-phase power supply for deriving first and second analog voltage indicating signals indicative of the amplitude and phase of the voltages across said first and second and said second and third phases, respectively; means for supplying said first and second analog voltage indicating signals to respective analog voltage input terminals to said first and second analog multiplier circuits means respectively; electronic phase adjusting means connected intermediate the output of one of said potential transformer means and the voltage input terminals to the analog multiplier circuit means it supplies for introducing a phase shift in the phase of the voltage indicating signal supplied thereto sixty degrees lagging relative to the voltage indicating signal supplied to the opposite analog multiplier circuit means; and means for summing together the outputs of the analog multiplier circuit means to derive an output analog signal representative of leading and lagging VARS quantities of electric power supplied from the three-phase power supply.

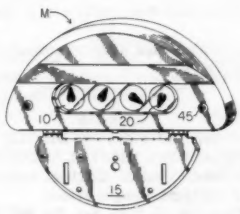


4,556,844

APPARATUS FOR MOUNTING AN ELECTRICAL SENSING DEVICE OR ENCODER ON A DATA OUTPUT INDICATOR OR METER

Thomas D. Wason, Raleigh, N.C., assignor to Cain Encoder Company, Greenville, N.C.

Filed Nov. 2, 1983, Ser. No. 547,884
Int. Cl.[4] G01R *1/04*
U.S. Cl. 324—156 **4 Claims**



1. An apparatus for mounting a sensing means adjacent the face of a device having one or more movable, visual indicators thereon of a type for indicating data output from any of various sources, where said indicators are mounted on shafts extending through said face plate and at least some of the operative components of the indicators are mounted on a support plate which is secured to the rear of the face plate by means of opposing pairs of post members, one pair of posts being on each opposite side of said face plate, said mounting apparatus comprising:

(a) a housing for said sensing means;

(b) a plurality of clips having a length and configuration such that one of said clips can be snap-locked onto one of said pairs of spaced post members;

(c) means for securing, in a prescribed alignment, said housing to said clips;

whereby said sensing means, when so mounted, is in correct operative alignment with said movable indicators for correctly sensing the data output thereof.

4,556,845

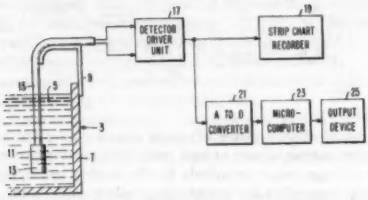
METHOD FOR MONITORING DEPOSITION RATE USING AN EDDY CURRENT DETECTOR

Douglas H. Strope, Apalachin, and Thomas E. Wray, Vestal, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 17, 1982, Ser. No. 378,697

Int. Cl.[4] G01B 7/10; G01R 33/12

U.S. Cl. 324—230 **4 Claims**



4. A method of monitoring the real time deposition rate of a metallic deposition process by the steps of:

utilizing an eddy current sensor;

connecting measuring means to the output of the eddy current sensor;

positioning the eddy current sensor at a predetermined distance of a test surface in a wet electroless plating bath where the deposition is taking place;

monitoring the output of the sensor with respect to the amplitude and the rate of change of the output;

recording the output curve of the sensor;

determining the seeding effectiveness and the plating bath solution activity from the initial portion of the output curve which indicates the time from the immersion of the sensor to a time when plating commences;

determining the initiation of the plating operation from the steep portion of the curve;

determining the thickness of the plating after a plating operation has taken place from the central portion of the curve; and

determining displacement measurements from the final portion of the curve.

4,556,846

EDDY CURRENT TESTING DEVICE WITH A BALANCING DIGITAL MEMORY

Jean-Pierre D'Hondt, Tournai, Belgium, assignor to Intercontrole Societe Anonyme, Rungis, France

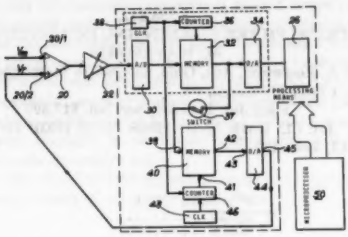
Filed Feb. 18, 1983, Ser. No. 467,762

Claims priority, application Belgium, Feb. 23, 1982, 892 243

Int. Cl.[4] G01N 27/82, 27/87

U.S. Cl. 324—238 **2 Claims**

1. An eddy current non-destructive testing device comprising an exciting generator, a probe connected to the latter, an amplifier having two inputs connected to the probe and an output supplying a measuring voltage, a differential amplifier having a first and a second input and an output, the first input receiving the measuring voltage, a variable gain amplifier having an input connected to the output of the differential amplifier, said amplifier having an output, an analog—digital converter having an input connected to said output of said amplifier and having an output, a first random access memory having an input connected to the output of said analog—digital converter, and an output, a second random access memory having an input and an output, a switching circuit being connected between the output of the first random access memory and the input of said second random access memory and a



digital analog converter having an input connected to the output of the second random access memory and an output connected to the second input of said differential amplifier.

4,556,847

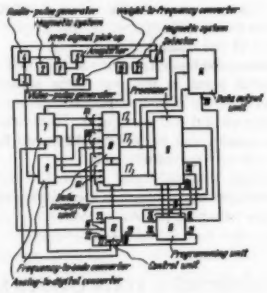
METHOD OF QUANTITATIVE ANALYSIS OF SUBSTANCES AND NUCLEAR-RESONANT QUANTITATIVE ANALYZER THEREFOR

Evgeny K. Aspiotis; Boris Y. Vitjuk; Evgeny I. Malakhov; Boris V. Danshin, all of Krasnodar; Vladimir A. Sokolov, Odessa; Anatoly S. Sidorov, Odessa, and Leonid V. Volkov, Odessa, all of U.S.S.R., assignors to Vsesojuzny Nauchno-Issledovatelsky Institut Maslichnykh Kultur Imeni V.S. Pustovoita, Krasnodar, U.S.S.R.

Filed Nov. 7, 1983, Ser. No. 549,446

Int. Cl.[4] G01R 33/08

U.S. Cl. 324—307 **3 Claims**



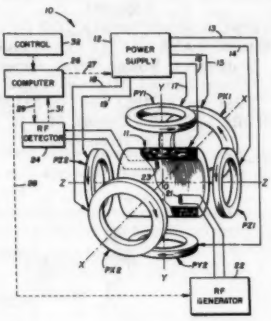
1. A method of quantitative analysis of substances based on utilization of a nuclear magnetic resonance phenomenon and comprising the steps of determining mass of a sample of substance to be analyzed, obtaining therefrom and accumulating nuclear magnetic resonance (NMR) signals during n measuring cycles, computing during each of said n measuring cycles a mean value of said nuclear magnetic resonance signals accumulated by the present measuring moment, computing during each of said n measuring cycles a standard deviation of said mean value, determining a difference between said standard deviation and a permissible limiting standard deviation value set before the analysis to obtain a desired analyzing accuracy, stopping said accumulation of the NMR signals during the n_i^{th} cycle, in which said difference is a positive value, and determining percentage of components in the sample being analyzed with regard to its mass and said mean value of the NMR signals computed during said n_i^{th} measuring cycle.

4,556,848

POINT SENSITIVE NMR IMAGING SYSTEM USING A MAGNETIC FIELD CONFIGURATION WITH A SPATIAL MINIMUM

Philippe H. Eberhard, El Cerrito, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Feb. 1, 1983, Ser. No. 462,816
Int. Cl.⁴ G01R *33/08*
U.S. Cl. 324—309 **10 Claims**



1. The method of investigating a specimen having magnetically resonant nuclei comprising:

(a) providing a relatively strong magnetic and substantially uniform field with no variations in time and having a direction along an axis passing said specimen,

(b) superimposing a first of relatively weak perturbing magnetic fields with no variations in time on said relatively strong magnetic field, said perturbing fields being spaced apart along said axis and in the same direction along said axis to establish a point of minimum magnetic field strength at a location between said perturbing fields and within said specimen,

(c) irradiating said specimen with high frequency radiation of a frequency of the magnetic resonance of said nuclei at said location of minimum fields strength,

(d) detecting signal information resulting from the magnetic resonance of said nuclei, and

(e) applying a second pair of relatively weak perturbing magnetic fields to said specimen, said fields of said second pair being spaced apart and oppositely directed and centered on a second axis orthogonal to said first axis, and

(f) applying a third pair of relatively weak perturbing magnetic fields to said specimen, said fields of said third pair being spaced apart and oppositely directed and centered on a third axis which is orthogonal to both said first and second axes, said second and third pairs of magnetic fields having no variations in time.

4,556,849

APPARATUS FOR MEASURING THE GRAIN-SIZE COMPOSITION OF POWDERS

Lev I. Kalakutsky, Kuibyshev; Vladimir V. Sychenkov; Vladimir B. Vlasov, both of Tolyatti, all of U.S.S.R., and Adolf V. Dubrovsky, deceased, late of Tolyatti, U.S.S.R. (by Nina V. Dubrovskaya, administrator), assignors to Vsesojuzny Nauchno-Issledovatelsky Institut Nerudnykh Stroitelnykh Materialov Gidromekhanizatsii, Tolyatti, U.S.S.R.

Filed Mar. 1, 1983, Ser. No. 470,956
Int. Cl.⁴ G01N *27/62*
U.S. Cl. 324—464 **6 Claims**

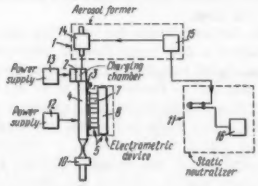
1. In an apparatus for measuring grain-size composition of powders, including:

a device for transforming a powder into a gaseous flow of individual particles;

a charging chamber communicating with said device for transforming the powder, each particle of the powder acquiring a charge proportional to its surface area in said charging chamber;

a precipitating capacitor having a high-voltage electrode and a collector plate which are placed parallel to one another and spaced apart so as to define there between a path for the passage of the flow of charged particles from said charging chamber, the flow of charged particles being separated in said precipitating capacitor into various fractions in accordance with the charge on the particles; and

an electrometric device for measuring the total charge of individual fractions are provided, said electrometric device, comprising a plurality of inductive sensors of charged particles, the number of the inductive sensors being equal to the number of fractions, each said inductive



sensor having an input and an output, and being installed in the collector plate of the precipitating capacitor, a signal being formed during operation of the apparatus at the output of the inductive sensor of charged particles which is proportional to the total charge of all particles of a given fraction; and an amplifier having an input and an output, wherein the improvement comprises:

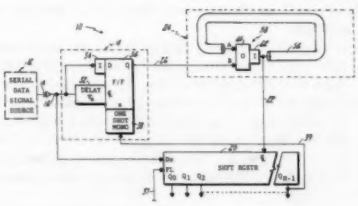
a plurality of switching devices, one switching device being provided for each sensor, each switching device having an input and an output and including a sealed contact means for avoiding charge leakage from the respective sensors; the input of each switching device being connected to the output of the respective sensor; the output of each switching device being connected to the input of the amplifier; a pulse train appearing at the output of the amplifier during operation of the apparatus which characterizes the grain-size composition of the powder being studied.

4,556,850

SERIAL TO PARALLEL DATA CONVERSION CIRCUIT

Gregory J. McBrien, Portland, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Nov. 1, 1982, Ser. No. 438,115
Int. Cl.⁴ H03K *17/00*
U.S. Cl. 328—72 **4 Claims**



1. Apparatus for converting to parallel bit format asynchronous serial bit digital signals received at a line frequency in successive frames, each frame beginning with a START bit and ending with a last data bit, each bit having a bit cell time, comprising:

register means responsive to a clock signal for receiving the

serial bit digital signals at a serial bit input thereof and shifting the serial bits in each frame to a parallel bit output thereof sequentially from the START bit to the last data bit in dependence on said clock signal and providing an end of frame signal indicative of the presence of the last data bit in said register means;

gated oscillator means receiving, alternately, a gate enable signal and a gate disable signal at a gate signal input thereof, for providing, at a frequency substantially equal to the line frequency, said clock signal in the presence of said gate enable signal;

as characterized by oscillator control means comprising;

inverter means for receiving the digital signals at an input thereof and providing inverted digital signals at an output thereof,

time delay means for receiving the digital signals at an input thereof and providing the digital signals to an output thereof after a delay of a selected portion of the bit cell time,

bistable latching means for receiving said inverted digital signals at a data input thereof, receiving said time delayed digital signals at a clock input thereof, and receiving said end of frame signal at an asynchronous input thereof, said bistable latching means providing said gate enable signal when each signal transition of said delayed digital signal occurs during a selected level of said inverted signal, said bistable latching means providing said gate disable signal in the presence of said end of frame signal.

4,556,851

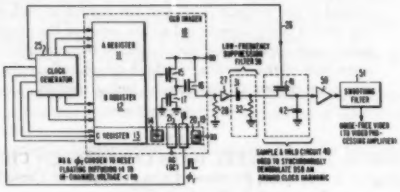
REDUCTION OF NOISE IN SIGNAL FROM CHARGE TRANSFER DEVICES

Peter A. Levine, Mercer County, N.J., assignor to RCA Corporation, Princeton, N.J.

Continuation-in-part of Ser. No. 525,491, Aug. 22, 1983, abandoned. This application Mar. 21, 1985, Ser. No. 714,490

Int. Cl.⁴ H03K *9/02*

U.S. Cl. 329—50 **24 Claims**



1. A method of improving the signal-to-noise ratio of output signal from a charge transfer device, samples of which output signal are supplied at a clocking frequency rate via a floating diffusion and an electrometer stage, said method comprising the steps of:

resetting said floating diffusion to an in-channel barrier potential, rather than resetting to a reset drain potential by field effect transistor action, for reducing reset noise;

filtering the output signal samples supplied from said electrometer stage to suppress at least the lower frequencies of the baseband spectrum thereof, for reducing flicker noise or "1/f" noise, and for reducing smear generated by resetting said floating diffusion to an in-channel barrier potential; and

synchronously detecting the filtered output signal samples, against a harmonic of said clocking frequency for obtaining an output signal with improved signal-to-noise and with baseband response extending through said suppressed lower frequencies.

23. In the combination of a charge-coupled device (CCD) imager supplying a series of spaced image response samples at a clocked rate, a low-frequency suppression filter connected after said CCD imager to suppress flicker noise or "1/f" noise, and a sample-and-hold circuit sampling said image response samples with suppressed flicker noise or "1/f" noise at said clocked rate to provide an output video signal, the improvement wherein said low-frequency suppression filter passes the higher frequencies of the baseband spectrum of said spaced image response samples for providing video peaking of said output video signal.

4,556,852

MOUNTING A SEMICONDUCTOR DEVICE IN A MICROWAVE CAVITY OSCILLATOR

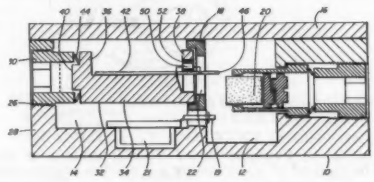
Maciej E. Znojkiewicz, Mount Royal, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Sep. 19, 1983, Ser. No. 533,356

Claims priority, application Canada, May 16, 1983, 428269

Int. Cl.⁴ H03B *7/12*

U.S. Cl. 331—96 **10 Claims**



1. A microwave cavity oscillator comprising:

(i) a housing containing a cavity, a chamber adjacent the cavity and communicating therewith by way of a hole extending therebetween;

(ii) a carrier supported by the housng and carrying a substrate, supporting a semiconductor device, wherein the carrier is releasably secured to the housing so as to be readily removable complete with the substrate, and is mounted adjacent said hole such that said semiconductor device is coupled to the cavity by way of the hole.

4,556,853

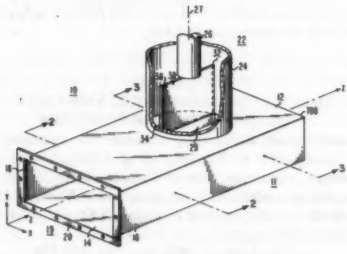
MODE-CONTROLLING WAVEGUIDE-TO-COAX TRANSITION FOR TV BROADCAST SYSTEM

Raymond N. Clark, Cherry Hill, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Sep. 28, 1984, Ser. No. 655,529

Int. Cl.⁴ H01P *5/103*

U.S. Cl. 333—26 **6 Claims**



1. A rectangular-waveguide-to-coaxial-transmission-line coupler, comprising:

a section of rectangular waveguide having mutually parallel pairs of wide walls and narrow walls, said wide walls being bisected by a plane of symmetry parallel with said narrow walls, one of said wide walls defining a circular

aperture having a diameter and also having a center lying in said plane of symmetry;

short-circuit terminating means coupled to said section of rectangular waveguide at a distance from said center of said aperture;

cylindrical outer-conductor means having an axis and also having a second, outer, diameter greater than said diameter of said aperture, said cylindrical outer-conductor means intersecting said one of said wide walls with said axis lying in said plane of symmetry and intersecting said center of said aperture whereby said aperture couples the interior of said rectangular waveguide with the interior of said cylindrical outer-conductor means;

a flat conductive plate extending diametrically across said cylindrical outer-conductor means and coupled to the walls thereof at diametrically opposed locations, the plane of said flat conductive plate lying in said plane of symmetry, said plate being located so that edge of said plate closest to said aperture coincides with the plane of said aperture; and

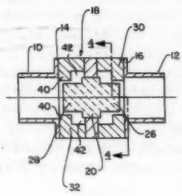
a cylindrical center-conductor coaxial with said cylindrical outer-conductor means and coupled to that portion of said flat conductive plate remote from said aperture, said center-conductor terminating within said cylindrical outer-conductor means.

4,556,854

MICROWAVE WINDOW AND MATCHING STRUCTURE

Yukio Hiramatsu, Los Altos, Calif., assignor to Litton Systems, Inc., Beverly Hills, Calif.

Filed Jun. 29, 1984, Ser. No. 625,987
Int. Cl.[4] H01P *1/08*
U.S. Cl. 333—34 **3 Claims**



1. In the structure of two rectangular waveguides chosen from the class consisting of ridged or unridged waveguides, each having a long dimension "a" and a short dimension "b", a circular alumina window positioned between said waveguides to carry microwave energy therebetween, said window being positioned substantially symmetrically at the center of said long and short dimensions, and an impedance matching structure for matching said window to said rectangular waveguides, said window and impedance matching structure being characterized by:

said window having substantially the same "b" dimension as the "b" dimension of the larger of said waveguides;

each said impedance matching structure having a first rectangular waveguide part adjacent said window with its "b" dimension "b1" greater than the "b" dimension of the waveguide to which it is matched;

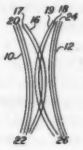
each of said first rectangular wave guide parts juxtaposed with a second waveguide part of identical type to the said waveguide to which it is matched and having a minimum "b" dimension "b_0" that is less than the minimum dimension, in the "b" direction, of such waveguide to which it is matched.

4,556,855

RF COMPONENTS AND NETWORKS IN SHAPED DIELECTRICS

Bing Chiang, Beltsville, Md., and Boris Sheleg, Alexandria, Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 31, 1983, Ser. No. 547,511
Int. Cl.[4] H01P *5/18*
U.S. Cl. 333—113 **13 Claims**



1. A microwave/millimeter wave waveguide coupler comprising:

a first waveguide comprising a first bundle of dielectric microwave/millimeter wave waveguide fibers;

a second waveguide comprising a second bundle of dielectric microwave/millimeter wave waveguide fibers; and

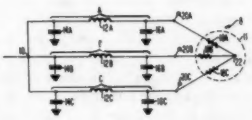
a coupling region wherein said first and second fiber bundles are in proximity and wherein at least one fiber from at least one waveguide fiber bundle crosses over and couples with the other waveguide fiber bundle, wherein the number of fiber crossovers determines the strength of the waveguide coupling, wherein said at least one fiber in said coupling region comprises at least one dielectric fiber from said first waveguide fiber bundle which crosses over to and becomes an integral part of said second waveguide fiber bundle.

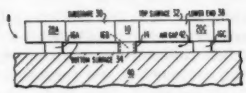
4,556,856

PLANAR, LUMPED ELEMENT, MATCHED N-WAY POWER DIVIDER

Adolph Presser, Kendall Park, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Sep. 18, 1984, Ser. No. 651,845
Int. Cl.[4] H03H *7/48*; H01P *5/12*
U.S. Cl. 333—124 **13 Claims**





1. An N-way power divider for operation over a range of frequencies, comprising:

a dielectric substrate having first and second opposed major surfaces;

a common terminal and N branch terminals disposed on said substrate;

a ground conductor disposed in fixed, spaced relation to said substrate;

N inductors disposed on said first surface of said substrate, each connected between said common terminal and a different one of said N branch terminals;

N capacitors each connected between said ground conductor and a different one of said N branch terminals;

a capacitor connected between said ground conductor and said common terminal; and

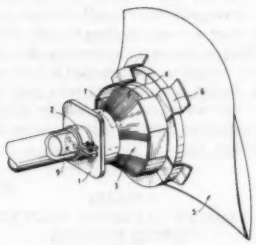
the capacitance value of said N capacitors and said capacitor connected to said common terminal and the inductance value of said N inductors being selected to provide between said common terminal and each of said N branch terminals a lumped element π network transmission line having a phase shift of about 90° at frequencies within said operating range of frequencies.

4,556,857

DEFLECTION YOKE FOR SMALL GUN-BASE CRT

James H. Logan, Chesapeake, Va., assignor to General Electric Company, Portsmouth, Va.

Filed Oct. 1, 1984, Ser. No. 656,809
Int. Cl.⁴ H01F 7/10
U.S. Cl. 335—210 **3 Claims**



1. A magnetic deflection yoke which achieves both self-convergence and four-sided pincushion correction in a three gun 110° in-line cathode ray tube having an envelope comprising a neck portion and a funnel portion, said neck portion of the cathode ray tube envelope housing a gun base no larger than 5.9 mm, said deflection yoke comprising:

a set of saddle-type innermost coils and a pair of torodial-type vertical deflection coils, said set of saddle-type horizontal deflection coils being segmented and having flanged ends with the radius of one end being larger than the other to conform to the shape of the funnel portion of the cathode ray tube envelope, the radius of the other end conforming to the diameter of said neck portion;

a permeable core surrounding said set of saddle-type horizontal deflection coils onto which said pair of vertical deflection coils are wound, said pair of vertical deflection coils being wound with a positive third harmonic Fourier coefficient;

an insulating coilform between said set of horizontal deflection coils and said pair of vertical deflection coils for supporting said coils and facilitating their mounting to said neck portion of the cathode ray tube envelope;

magnetic field collector means comprising collector means essentially surrounding said vertical deflection coils and field shaper and shunt means extending along and parallel to the funnel portion of the cathode ray tube envelope for directing lines of magnetic flux through the cathode ray tube envelope; and

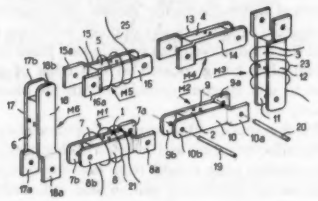
magnetic field shunt means positioned between said vertical deflection coils and said insulating coilform for modifying the field of said pair of vertical windings so that it behaves as though it were wound with negative third harmonic Fourier coefficient value.

4,556,858

BISTABLE ELECTROMAGNET WITH SEVERAL ARMATURES COMPRISING A PERMANENT MAGNET

Gérard Koehler, Ville d'Avray, France, assignor to La Telemecanique Electrique, Nanterre, France

Filed Oct. 30, 1984, Ser. No. 666,312
Claims priority, application France, Nov. 16, 1983, 83 18186
Int. Cl.⁴ H01F 7/08
U.S. Cl. 335—234 **12 Claims**



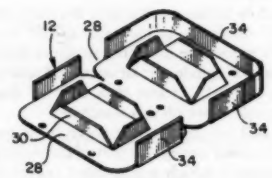
1. Bistable electromagnet whose magnetic circuit, partially surrounded by a winding is constituted by a series of links (M1, M2, M3, M4, M5, M6) interconnected by air gaps, the links of a first type being movable relative to the other links of a second type, certain types of links comprising a permanent magnet (1, 3, 5, . . .) provided on its pole faces with pole pieces (7, 8; 11, 12; 15, 16; . . .) whose ends define two air gap zones with the neighboring links of the other type, each air gap zone being adapted to engender alternatively two opposite forces whose directions are parallel to the magnetic directions of the permanent magnets, two forces engendered simultaneously by a same link after excitation in a given direction of the winding being of the same direction, characterized in that each permanent magnet (1, 3, 5) of one type of link (M1, M3, M5) is subjected to the influence of a winding (21, 23, 25) whose field is perpendicular to the magnetic direction of said permanent magnet and directed toward one or the other of the ends of the pole pieces (7, 8; 11, 12; 15, 16) with which this magnet is provided, such that the electromagnet will have the shape of a closed chain, adapted to follow a variable path in a plane P and being able to create, lengthwise of its extent, forces F1, F2 perpendicular to this plane.

4,556,859

METHOD AND STRUCTURE OF INDIVIDUALLY SHIELDED, RELAY, PICKUP AND HOLDING COILS, TO REDUCE THE EFFECTS OF EXTERNAL AND INTERNAL TRANSIENTS

Howard H. Sheppard, 7430 Sprague St., Philadelphia, Pa. 19119

Filed Sep. 13, 1982, Ser. No. 417,239
Int. Cl.⁴ H01F 7/00
U.S. Cl. 335—301 **12 Claims**



1. A method of reducing transients in a direct current relay

provided with a direct current operating coil and a direct current holding coil, comprising the steps of:

providing said direct current holding coil in the form of a substantially flat coil mounted in axial alignment with said direct current operating coil; and

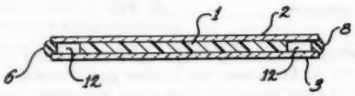
providing a non-magnetic conductive shield in close proximity to at least said flat holding coil and juxtaposed over substantial portions of one flat surface of said coil and a substantial portion of the peripheral surface of said flat holding coil.

4,556,860

CONDUCTIVE POLYMERS

Russell H. Tobias, Reynoldsburg, and David A. Hutchings, Newark, both of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Jan. 19, 1984, Ser. No. 572,035
Int. Cl.⁴ H01C *7/10*
U.S. Cl. 338—22 SD **9 Claims**



1. A method of producing an electrical conductor which comprises:

a. treating a polymeric material with a dopant to make the material electrically conductive;

b. locating said polymeric material in an encasment comprised of a pair of ribbon-like members having planar opposed matching surfaces, said encasement being substantially electrically non-conductive and substantially impermeable to said dopant, said polymeric material being positioned between the matching surfaces in contact with each of said surfaces effective to substantially reduce the loss of dopant from said polymeric material;

c. extending electrical conducting means in contact with said polymeric material to the exterior of the encasement;

d. filling any space between the matching surfaces not occupied by the polymeric material with an inert gas; and

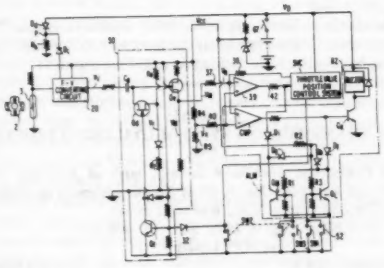
e. sealing said encasement around the edges thereof to retain said inert gas in said encasement.

4,556,861

AUTOMOBILE SPEED CONTROL SYSTEM

Hitoshi Hyodo, Okazaki, and Naoji Sakakibara, Chiryu, both of Japan, assignors to Aisin Seiki K.K., Kariya, Japan

Filed Dec. 28, 1982, Ser. No. 453,990
Claims priority, application Japan, Dec. 28, 1981, 56-213034
Int. Cl.⁴ G08B *21/00*
U.S. Cl. 340—62 **4 Claims**



1. An automobile speed control system for automatically controlling the speed of an automobile having memory and cancel circuits comprising:

a speed generator circuit for generating a first electrical signal indicative of actual automobile speed;

desired automobile speed signal supply circuit means for supplying a second electric signal indicative of the desired automobile speed;

first comparator circuit means having a first input connected to said first electrical signal and a second input connected to said second electrical signal for generating an engine throttle control signal from said first and second signals;

alarm means; and

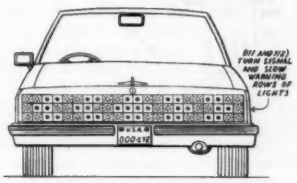
switching means connected to the output of said comparator for driving said alarm means when the actual automobile speed exceeds a predetermined speed during a period when a said second signal has been stored in said memory circuit but said cancel circuit is operative to prevent said speed control system from controlling the speed of said automobile.

4,556,862

VEHICLE DIRECTION SIGNAL AND SLOW WARNING SYSTEM EMPLOYING MOVING PATTERN OF SIMULTANEOUSLY ON LAMPS

Charles I. Meinershagen, P.O. Box - 705, Redding, Calif. 96099

Filed May 16, 1983, Ser. No. 495,031
Int. Cl.⁴ B60Q *1/00*
U.S. Cl. 340—67 **18 Claims**



REAR VIEW OF TYPICAL PASSENGER MOTOR VEHICLE

1. A method of signaling the condition of a movable vehicle in the presence of traffic, comprising the following steps:

(1) providing a movable vehicle,

(2) providing a row of individual lamps on a side of said vehicle, and

(3) turning said lamps on and off to form a moving pattern of turned-on lamps, as follows:

(a) turning on a plurality of spaced-apart lamps simultaneously so that each lamp in said turned-on plurality will present one visual characteristic and the rest of said lamps, including at least one lamp physically intermediate and separating said turned-on plurality of lamps, will present a different visual characteristic, and so that said turned-on plurality of lamps will be visually distinguishable from the rest of said lamps and present a recognizable predetermined pattern of spaced-apart and simultaneously-turned-on lamps,

(b) turning off said previously-turned-on plurality of said lamps and simultaneously turning on a new and different plurality of spaced-apart lamps, said different plurality of lamps being adjacent said respective previously-turned-on plurality of lamps in one direction along said row, such that said recognizable predetermined pattern of spaced-apart lamps will appear to have moved along said row to a new position in said one direction, and

(c) thereafter repeating said step (b) so that each last-turned-on plurality of lamps will be turned off and simultaneously a new plurality of said lamps will be turned on, each new plurality of turned-on lamps being adjacent the last-turned-on plurality of lamps in said one direction along said row, such that said recognizable

predetermined pattern of spaced-apart lamps will appear to move along said row in said one direction,

whereby said vehicle will present a moving pattern of turned-on lamps which will be recognizable in the presence of conventional flashing static turn signals and traffic lamps.

4,556,863

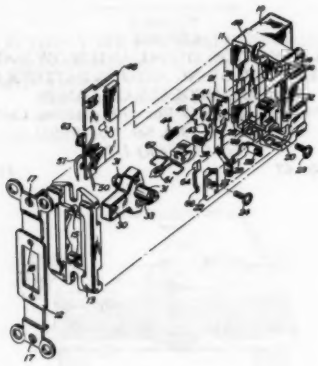
EMERGENCY LIGHT SWITCH

Charles J. Devitt, Glen Cove; LeRoy M. Freeman, Westbury, both of N.Y., and Saul I. Slater, Miami Beach, Fla., assignors to Slater Electric Inc., Glen Cove, N.Y.

Filed Dec. 6, 1982, Ser. No. 446,917

Int. Cl.[4] B60Q *1/46*; G08B *5/00*

U.S. Cl. 340—81 R **11 Claims**



1. A switch apparatus for emergency signaling utilizing an existing two-wire circuit running between a switch box and a load comprising:

(a) a body mounted within the switch box having a cavity and a cover over said cavity,

(b) an electronic circuit mounted within said cavity and connected in series with the load, said electronic circuit, when activated, switching power flow to the load on and of continuously at a predetermined frequency and a predetermined duty cycle independently of load size so that dangerous heating of said electronic circuit is avoided, and

(c) a switching mechanism mounted within said cavity comprised of:

(1) conducting means positionable either between an alternating power source and the load so that the load is on continuously, at a neutral position so that the load is off continuously, or between said alternating power source and said electronic circuit so that the load is switched on and off continuously at said predetermined frequency and said predetermined duty cycle,

(2) an actuator mounted on said body engaging said conducting means for controlling positioning of said conducting means, and

(3) a detenting mechanism for regulating positioning of said actuator, said detenting mechanism being comprised of an asymmetrical cam forming one end of said actuator and a cam follower rotatably mounted within said cavity and bearing against said asymmetrical cam, said asymmetrical cam requiring additional force to be exerted to position said conducting means between said alternating power source and said electronic circuit.

4,556,864

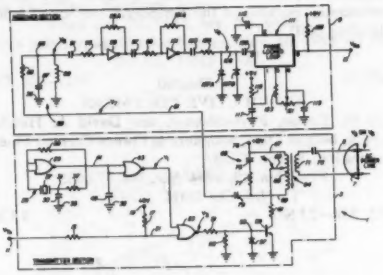
APPARATUS AND METHOD FOR COMMUNICATING DIGITAL INFORMATION ON AC POWER LINES

Joseph J. Roy, 7027 N. 78th Pl., Scottsdale, Ariz. 85258

Filed Aug. 26, 1982, Ser. No. 411,686

Int. Cl.[4] H04M *11/04*

U.S. Cl. 340—310 A **23 Claims**



1. A method for obtaining a logic signal from a first signal conducted by an AC power line to effect digital communication, said first signal including a first signal component having a first frequency for a first duration, said first signal component representing a first digital logic state, said first signal also including an impulse noise component and an outband signal component having a second frequency substantially different than said first frequency, said method comprising the steps of:

(a) coupling said first signal to an inductive component of a first tuned circuit, said first tuned circuit having a resonant frequency that is substantially equal to said first frequency, said impulse noise component including a relatively large inband noise component having a frequency that is approximately equal to said first frequency, said first signal component and/or said inband noise component causing said first tuned circuit to oscillate at its resonant frequency;

(b) rapidly damping the oscillations of said first tuned circuit by means of a resistive element in said first tuned circuit immediately after the duration of said first signal component and/or of said inband noise component to rapidly reduce any continuing oscillation of said first tuned circuit immediately after the end of the duration of said inband noise component;

(c) filtering said first signal by means of a second tuned circuit that is substantially more selective than said first tuned circuit in order to further substantially attenuate any outband components of said first signal, said second tuned circuit having a resonant frequency that is substantially equal to said first frequency, said first signal emerging from said second tuned circuit with said first signal component and/or said inband noise signal therein, any previous outband components of said first signal having been substantially attenuated by said first and second tuned circuits; and

(d) producing a first logic signal level representing said first logic state if said first signal contains any AC components that have a duration as long as said first duration.

4,556,865

DATA TRANSMISSION SYSTEM UTILIZING POWER LINE

Hitoshi Fukagawa; Yoshiharu Suzuki, both of Kadoma, and Yoshiyuki Komoda, Osaka, all of Japan, assignors to Matsushita Electric Works, Ltd., Kadoma, Japan

Filed Aug. 9, 1982, Ser. No. 406,196

Int. Cl.[4] H04B *3/54*

U.S. Cl. 340—310 R **2 Claims**

1. A data transmission system utilizing a power line including first and second communicating means coupled to said

power line at spaced apart points, repeater means connected to said power line between said first and second communicating means for transmitting through said repeater means control data including a plurality of bits in the form of a high frequency signal superimposed on an alternating current of a power supply supplied over said power line between said first and second communicating means,

said first communicating means including

first transmitting means for transmitting said

control data to said second communicating means, and first receiving means for receiving said control

data transmitted from said second communicating means;

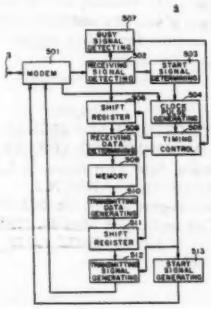
said second communicating means including

second receiving means, operatively connectable to a load having control states, for receiving said control data transmitted from said first communicating means and for controlling the load in accordance with said control data, and

second transmitting means for transmitting to said first communicating means control state data representing the control of the load;

said repeater means including

storing means for storing the control data being transmitted between said first and second communicating means,



high frequency signal blocking means coupled to said power line for blocking passage of said high frequency signal by separating the first communicating means side of said power line from the second communicating side of said power line for high frequency signals, while allowing for passage of said alternating current,

storage control means, for determining on which side of said high frequency signal blocking means control data transmitted from one of said first and said second communicating means along the power line is being transmitted, for providing determination result data and for making said storing means store said control data transmitted from one of said first and second communicating means coupled to said power line spaced apart from said high frequency blocking means together with the determination result data, and

means for reading said control data and the determination result data stored in said storing means after a predetermined period of time and for transmitting said control data through the other side of the power line connected to said high frequency signal blocking means in response to the determination result.

4,556,866

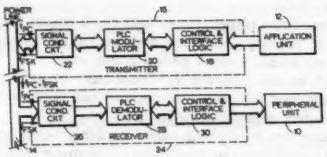
POWER LINE CARRIER FSK DATA SYSTEM

James L. Gorecki, Chandler, Ariz., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Mar. 16, 1983, Ser. No. 475,802

Int. Cl.[4] H04L *27/10*; H03D *3/18*; H03C *3/00*

U.S. Cl. 340—310 A **17 Claims**



4. A transmitter of a periodic frequency shift keyed (FSK) signal carried on an electrical power line which also carries alternating current electrical power having a frequency f_{PC}, the FSK signal having a frequency f_{FSK} during each of a sequence of bit time periods which represent binary bits to be transmitted, the transmitter comprising:

means for deriving from the power line an input signal having frequency f_{PC};

phase locked loop means locked to the input signal having frequency f_{PC} for synthesizing the FSK signal and a transmitter timing signal which determines the bit time periods, wherein the phase locked loop means comprises:

oscillator means for producing the FSK signal with a frequency f_{FSK} which is a function of a first control signal and a second control signal;

divider means for dividing the FSK signal to produce a synthesized signal having a frequency f_{SPC} which is equal to f_{PC} when the first phase locked loop means is in lock and to produce the transmitter timing signal which defines the bit time period for each bit to be transmitted;

phase detector means for providing a first phase detector output which is a function of a phase comparison of the signal having frequency f_{PC} and the synthesized signal having frequency f_{SPC}; and

means for providing the first control signal as a function of the first phase detector output;

control means for providing the second control signal during each bit time period which causes the oscillator means to produce the FSK signal with a frequency f_{FSK} which is greater than a reference frequency f_O if the bit to be transmitted has a first binary state and which is less than f_O if the bit to be transmitted has a second binary state; and

means for providing the FSK signal to the power line.

4,556,867

DUAL RATE, INTEGRATING, ANALOG-TO-DIGITAL CONVERTER

Richard E. George, Everett, Wash., assignor to John Fluke Mfg. Co., Inc., Everett, Wash.

Filed Nov. 1, 1982, Ser. No. 438,374

Int. Cl.[4] H03K *13/02*

U.S. Cl. 340—347 NT **14 Claims**

1. A converter circuit for providing both high rate, low accuracy and lower rate, higher accuracy analog to digital conversion, comprising:

analog input means for receiving analog signals;

digital output means for outputting digital signals proportional to said analog signals;

reference input means for receiving a predetermined reference signal;

base input means for receiving a predetermined base reference signal;

integrator means for integrating signals provided thereto and in response generating integrated signals;

comparator means responsive to said integrated signals and

said base reference signals to provide a reference integrated signal when said integrated and base reference signals have a predetermined relationship;

switching means for selectively applying to said integrator means signals from said analog, reference, or base input means and interconnecting said comparator means and said base input means;

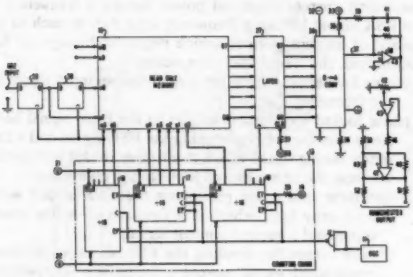
clock means for providing clock signals at a predetermined rate;

counter means responsive to said clock means for counting clock periods therefrom and providing to said digital output means a clock period count; and

control means operatively connected to said switching means, said integrator means, and said counter means,

said control means including:

(a) means for controlling said switching means to connect said analog input means to said integrator means for developing said analog input integrated signal, and to connect said reference input means to said integrator means until



said comparator means generates said reference integrated signal to define a sample cycle;

(b) means for causing said counter means to count during a period extending from the connection of said reference input means to said integrator means to generation of said reference integrated signal by said comparator means;

(c) means responsive to said reference integrated signal to cause said counter means to apply the count to a digital output means as a high conversion rate, low accuracy output;

(d) means for causing generation of a plurality of said sample cycles; and

(e) means for causing said switching means to connect said integrator and said comparator means to said base input means after generation of a predetermined number of said sample cycles;

means for accumulating said sample cycles; and

means for applying the accumulated predetermined number of sample cycles to the digital output means as a low conversion rate, high accuracy output.

4,556,868

CMI DECODER

Hans G. Härle, Leitershofen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

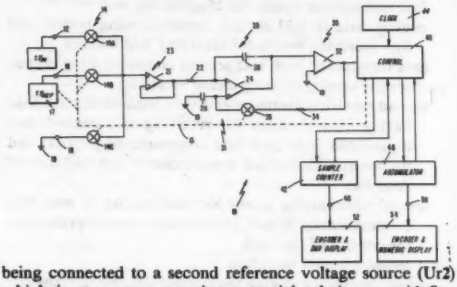
Filed Nov. 25, 1983, Ser. No. 555,309

Claims priority, application Fed. Rep. of Germany, Dec. 10, 1982, 3245845

Int. Cl.[4] H03K *13/24*

U.S. Cl. 340—347 DD **8 Claims**

1. CMI decoder for the translation of CMI coded signals into binary signals with differential amplifiers connected to the input side of said decoder, comprising: a first; a second; and a third differential amplifier (T1, T2; T3, T4; T5, T6) wherein an input of a first stage (T1) of said first differential amplifier is connected to an input of a second stage (T4) of said second differential amplifier and to a first reference voltage source (Ur1); an input of a second stage (T2) of said first differential amplifier and of a first stage (T3) of said second differential amplifier being connected to each other and to an input terminal (E); said first differential amplifier forming with a first stage (T5) of said differential amplifier a first cascade circuit and said second differential amplifier forming with a second stage (T6) of said third differential amplifier a second cascade circuit; an input of said second stage of said third differential amplifier



being connected to a second reference voltage source (Ur2) which is at a more negative potential relative to said first reference voltage source; an input of said first stage of said third differential amplifier being connected, via a time delay section τ with a delay corresponding to half a bit length, to said input (E) of said CMI decoder; and wherein outputs (A1 . . . A4) of said stages of said first and second differential amplifiers represent the outputs for binary signals which, upon being combined form a RZ signal.

4,556,869

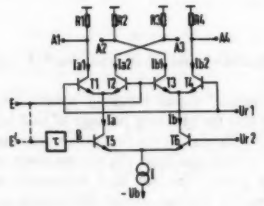
MULTI-FUNCTION DATA SIGNAL PROCESSING METHOD AND APPARATUS

David J. Thomson, New Providence, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Continuation-in-part of Ser. No. 502,198, Jun. 8, 1983, abandoned. This application May 23, 1985, Ser. No. 737,569

Int. Cl.[4] H03K *13/24*

U.S. Cl. 340—347 DD **4 Claims**



1. A data signal processing apparatus comprising

means for holding plural data signal bit-duration waveform sample sets, each sample being a digitally encoded representation of a corresponding analog sample amplitude, each set including different parts of at least n time adjacent signal bits to be provided to an output of said apparatus, where n is a number of corresponding apparatus input signal bit information states of a data stream required to define the same information in said output, each set representing a different one of 2^n possible information bit state combinations for such n corresponding time-adjacent input bits to said apparatus, each sample set being further configured to include at least conversion between first and second predetermined data bit code representations of the

same information, predistortion for anticipated transmission path effects unique to the particular combination of said time adjacent bits of said each sample set, and intersymbol interference compensation unique to said particular combination of time adjacent bits, and

means, responsive to successive overlapping sets of n input data signal bits of a data stream, each overlapping set including a current input data signal bit and a bit from a next previous overlapping set, for directly addressing said holding means to initiate readout of one of said waveform sample sets corresponding to the information bit state combination of the current-bit one of said overlapping sets.

4,556,870

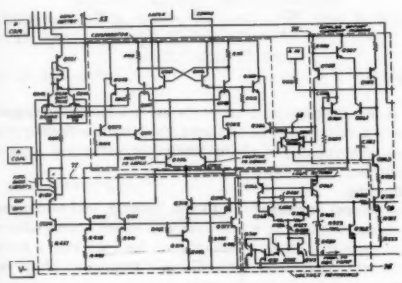
A-TO-D CONVERTER OF THE SUCCESSIVE-APPROXIMATION TYPE

Adrian P. Brokaw, Burlington, and Modesto A. Maidique, Lexington, both of Mass., assignors to Analog Devices, Incorporated, Norwood, Mass.

Division of Ser. No. 931,960, Aug. 8, 1978, Pat. No. 4,400,689, which is a continuation-in-part of Ser. No. 785,322, Apr. 7, 1977, abandoned. This application Mar. 25, 1982, Ser. No. 361,740

Int. Cl.[4] H03K *13/02, 13/08*

U.S. Cl. 340—347 AD **19 Claims**



1. A monolithic integrated circuit chip including:

digital-to-analog converter (DAC) means comprising a plurality of transistor current sources each including base, collector and emitter electrodes;

an output terminal for said converter means to provide an output current representing a summation of the individual currents contributed by said current sources in accordance with an input digital signal;

resistance network means connected to the emitters of said current source transistors to control the levels of the currents contributed thereby to said output terminal in accordance with a selected weighting pattern;

said network means including a bias potential terminal;

said digital-to-analog converter including means arranged so that the potentials of said current source emitters are maintained equal under different operating temperature conditions;

a common base line including circuit means coupling the bases of said transistor current sources together to provide for potential tracking thereof;

voltage reference means to furnish bias potential for said current sources and said resistance network means, and including a pair of output terminals;

means connecting said output terminals respectively to said common base line and said bias potential terminal;

said voltage reference means comprising a junction providing a d-c supply voltage the magnitude of which varies with the temperature of said chip;

resistor means connected between one side of said junction and the corresponding voltage reference output terminal to produce a voltage drop thereacross in accordance with the magnitude of current flowing through said resistor means;

current supply means to provide a flow of current through said resistor means to produce said voltage drop thereacross; and

said current supply means including current control means to cause said flow of current to vary with temperature in direction and amount to provide temperature compensation for the effects of said variations in d-c supply voltage of said voltage reference by producing corresponding changes in said voltage drop.

4,556,871

TOUCH SENSING DEVICE

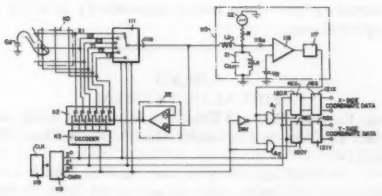
Kazuo Yoshikawa, Kawasaki; Hisashi Yamaguchi, Atsugi, and Toru Asano, Kawasaki, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Jun. 20, 1983, Ser. No. 505,979

Claims priority, application Japan, Jun. 18, 1982, 57-105665

Int. Cl.[4] G06F *3/02*

U.S. Cl. 340—365 C **5 Claims**



1. A touch sensing device having a plurality of touch sensing electrodes defining positions to be sensed and having an impedance between corresponding ones of the electrodes, said device comprising:

a touch sensing circuit to which said touch sensing electrodes are sequentially and selectively connected, said touch sensing circuit including-

an oscillator for supplying an AC signal to said selected touch sensing electrode; and

a buffer circuit means for isolating the AC signal from the selected touch electrode and for supplying the AC signal to the non-selected touch sensing electrodes, so that the non-selected touch sensing electrodes are clampled to substantially the same potential as that of the selected electrodes and an impedance between the adjacent touch electrodes is negligible.

4,556,872

PADLOCK WITH TAMPER ALARM

John F. Masoncup, 610 N. Maple Ct., Mount Prospect, Ill. 60056; Eric O. Peterson, Elgin, and Alan G. Peterson, Oak Park, both of Ill., assignors to John F. Masoncup, Mount Prospect, Ill.

Filed Aug. 18, 1983, Ser. No. 524,152

Int. Cl.[4] E05B *45/06*

U.S. Cl. 340—542 **36 Claims**

1. A padlock with a tamper alarm, said padlock comprising:

a body;

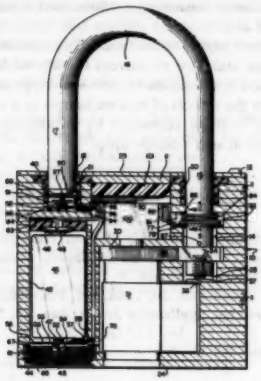
a shackle having a pair of legs;

means mounting said shackle for reciprocal movement relative to said body between a closed first position and an open second position of the shackle when the shackle is in its closed position;

lock means operable to disengage said latch means from said shackle;

alarm means actuable to sound an alarm;

and means, responsive to the movement of said shackle between its first and second position, for automatically



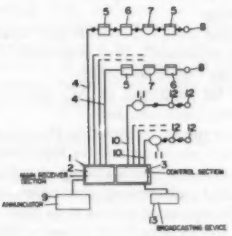
actuating said alarm means momentarily as a test of its operativeness.

4,556,873

FIRE ALARM SYSTEM

Kiyoshi Yamada, Mie, and Kazumasa Murakami, Aichi, both of Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

Filed Apr. 23, 1984, Ser. No. 602,749
Claims priority, application Japan, Apr. 30, 1983, 58-76826
Int. Cl.[4] G08B *17/10*
U.S. Cl. 340—630 **10 Claims**



1. A fire alarm system which comprises:

a plurality of smoke detectors adapted to be installed in different locations, each smoke detector measuring the density of possible smoke in corresponding location as analog data and producing a corresponding smoke density digital signal indicative of the smoke density;

a receiver connected through a data transmission line to said smoke detectors so as to receive the individual density signals from the smoke detectors;

fire judging means included in the receiver for determining the presence of fires and fire locations only when the smoke density signal from the smoke detector in the corresponding location exceeds a reference density level and at the same time when such smoke density lasts over a reference time period;

said receiver including selection means for selecting said reference density level among a plurality of predetermined density levels of different values for each smoke detector as well as for selecting said reference time period among a plurality of predetermined time periods of different values for each smoke detector; and

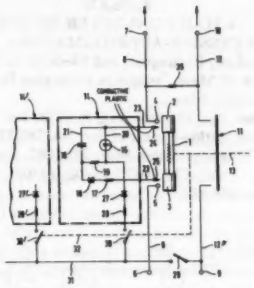
alarm means responding to the determination of presence of fire by said judging means for issuing an alarm signal.

4,556,874

FUSIBLE CIRCUIT BREAKER

Klaus Becker, Strullendorf, Fed. Rep. of Germany, assignor to Linder GmbH Fabrik Elektrischer Lampen und Apparate, Bamberg, Fed. Rep. of Germany

Filed Aug. 20, 1982, Ser. No. 409,901
Claims priority, application Fed. Rep. of Germany, Aug. 21, 1981, 3133094
Int. Cl.[4] G08B *21/00*
U.S. Cl. 340—638 **18 Claims**



1. A fuse-type circuit breaker for use in a circuit arranged to connect a voltage source to a load, the circuit including phase conductors defining a phase conductor path, and a circuit ground, the circuit breaker comprising:

a housing;

two current contacts fixed to said housing, said two current contacts including a first current contact connectable via a respective phase conductor to the load and a second current contact connectable via a respective phase conductor to the voltage source;

a fuse link having two contact caps and a fuse element connected between said contact caps, said fuse element having a normal operating state in which said fuse element provides a short circuit between said contact caps and having a malfunction response state in which said fuse element provides an open circuit between said contact caps, said fuse link being mounted in said housing to be manually movable between an on position in which each said contact cap is electrically connected to a respective current contact and an off position in which each said contact cap is electrically disconnected from the respective current contact;

an operating state indicator device for said fuse link, said indicator device including two input terminals disposed to each be electrically connected to a respective one of said contact caps at least when said fuse link is in said on position and circuit means connected between said input terminals and providing, between said input terminals, an electrical resistance which is very high relative to the normal operating state resistance of said fuse element, said circuit means comprising: a capacitor, a diode and a charging resistor connected together in series to form a first series circuit branch connected between said input terminals; and a light source and a discharge resistor connected together in series to form a second series circuit branch connected in parallel with said capacitor, said indicator device being operative to cause said light source to produce a blinking light signal only when said fuse link is in said on position and said fuse element is in its malfunction response state;

a high-resistance auxiliary resistor having a first end con-

nected to said first current contact and a second end connectable to the circuit ground at least when said fuse link is in said on position; and

second circuit means connected to said light source and including a switch member selectively connecting said light source to the circuit ground for applying to said light source a rectified current to cause said light source to produce a continuous light signal only when said fuse link is in said on position and said fuse element is in its normal operating state, whereby said light source produces: a blinking light signal only when said fuse link is in said on position and said fuse element is in its malfunction response state; a continuous light signal only when said fuse link is in said on position, said fuse element is in its normal operating state, and said second circuit means is connected to the circuit ground; and no light output when said fuse link is in said off position or when said fuse link is in said on position and said fuse element is in its normal operating state and said second circuit means is not connected to the circuit ground.

4,556,875

IRRADIATED POWER MONITORING SYSTEM FOR OPTICAL FIBER

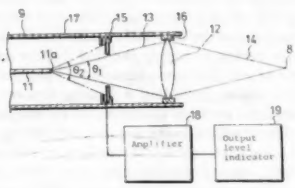
Hiromasa Ishiwatari, Ikoma, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kodoma, Japan

Filed Nov. 24, 1982, Ser. No. 444,331

Claims priority, application Japan, Dec. 15, 1981, 56-203272; Dec. 15, 1981, 56-203273

Int. Cl.⁴ G08B *21/00*

U.S. Cl. 340—679 **7 Claims**



1. An irradiated power monitoring and trouble monitoring system for a laser processing apparatus comprising:

a laser light source,

an optical fiber for transmitting laser light from said laser light source,

light focussing means for focussing said laser light received from an output end of said optical fiber, and

a light detector for detecting a marginal small portion of said laser light outside of a cone shaped emmission of said laser light from said output end of said optical fiber, said light detector being disposed between said output end of said optical fiber and said light focussing means.

4,556,876

DISPLAY DEVICE WITH DELAY TIME COMPENSATION

Osamu Shimizu; Hirofumi Goto, and Fumio Matsukawa, all of Amagasaki, Japan, assignors to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Shiba and Mitsubishi Denki Kabushiki Kaisha, Tokyo, both of, Japan

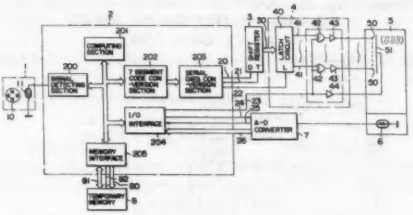
Filed Sep. 15, 1982, Ser. No. 418,299

Claims priority, application Japan, Sep. 22, 1981, 56-150315; Jan. 22, 1982, 57-8412

Int. Cl.⁴ G09G *3/00*

U.S. Cl. 340—713 **14 Claims**

14. A display device with delay time compensation having a segment type digital display unit, comprising a memory section for storing activation history for each segment in said display unit, and a control section having means coactive with said memory section for controlling the driving timing independently for each segment in said display unit as a function of individual activation history of the corresponding segment,



thereby to effect compensated values of time of energization of each individual segment to effectuate substantially simultaneous display renewal of each individual segment and discriminability at the same time.

4,556,877

DIGITAL DISPLAY DEVICE HAVING A CONTROLLING APPARATUS RESPONSIVE TO LOW TEMPERATURES

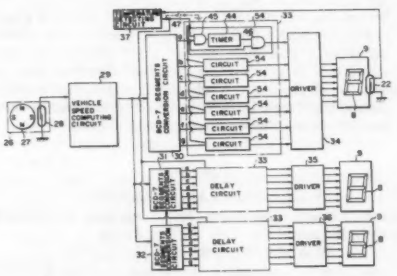
Naotake Kumagai; Ikuo Saga; Minoru Tatemoto, and Tetsuya Tada, all of Okazaki, Japan, assignors to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 15, 1982, Ser. No. 418,300

Claims priority, application Japan, Jan. 22, 1982, 57-8413

Int. Cl.⁴ G09G *3/00*

U.S. Cl. 340—713 **13 Claims**

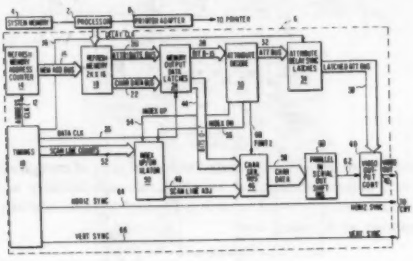


1. A digital display device comprising, a plurality of segments having means for performing a digital display, a driver for turning said segment on and off, delay apparatus, a controlling apparatus for supplying through said delay apparatus to said driver an activating signal for activating a segment which has been off and an OFF signal for turning off a segment which has been activated, temperature detecting means for detecting the ambient temperature in the environment of said segments, and said delay apparatus having means for delaying the activating signal received from said controlling apparatus during a predetermined time after the OFF signal is supplied from said controlling apparatus to said driver when ambient temperature detected by said temperature detecting means is lower than a predetermined value, whereby at each renewal of display all renewed segments are brought to a similar off state and thus are renewed substantially synchronously.

4,556,878
DISPLAY OF GRAPHICS USING A NON-ALL POINTS ADDRESSABLE DISPLAY

Jerold D. Dwire, Round Rock, Tex., and Donald T. Crehan, Gaithersburg, Md., assignors to International Business Machines Corp., Armonk, N.Y.

Filed May 11, 1983, Ser. No. 493,578
Int. Cl.⁴ G09G 1/00
U.S. Cl. 340—724 **8 Claims**



1. Apparatus for displaying curvilinear graphics on a non-all points addressable computer display in which character images are selected from a predefined character set and displayed within addressable character positions called character boxes, said apparatus comprising:

first means for storing a predetermined minimum number of first graphics characters which are substantially identical except for their relative positions within a character box;

means for assigning shift attributes to any of said first graphics characters to thereby effectively increase the number of said predetermined minimum number of first graphics characters by shifting their relative positions within a character box;

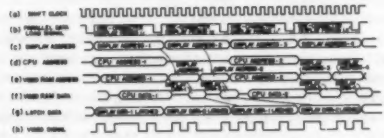
means for mapping a desired curvilinear graphics display onto an internal image character box display by selecting for each character box one of said predetermined minimum number of first graphics characters from said first means and storing said selected one of said first graphics characters with a shift attribute assigned by said means for assigning which most closely approximates the desired curvilinear graphics display for that character box; and

means for displaying the selected first graphics characters shifted according to their assigned shift attribute on said non-all points addressable computer display.

4,556,879
VIDEO DISPLAY APPARATUS

Kazuyuki Tanaka, Kamakura, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Mar. 31, 1982, Ser. No. 363,792
Claims priority, application Japan, Apr. 6, 1981, 56-51478
Int. Cl.⁴ G09G 1/00
U.S. Cl. 340—750 **2 Claims**



1. A video display apparatus comprising:

a video random access memory for storing data determining in a 1:1 relation at least one of characters and graphics which are to be displayed on a cathode-ray tube (CRT) display unit of the raster scan type:

a CRT controller which, in correspondence to data display positions on said CRT display unit, generates display addresses in successive one-character display periods, said CRT controller generating a first display address for a first one-character display period in a first half of a second, consecutive one-character display period and generating a second display address for a second one-character display period in a second half of the second one-character display period, the sum of the consecutive first and second one-character display periods forming one repetition period;

a CPU for controlling a read-write operation on said video random access memory and generating a CPU address for controlling a write operation to said video random access memory in said first one-character period;

address switching means having an input terminal connected to an address output terminal of said CRT controller and an address output terminal of said CPU and having an output terminal connected to an address input terminal of said video random access memory, for supplying the CPU address from said CPU to said video random access memory in said first one-character display period and supplying the first and second display addresses from said CRT controller to said video random access memory in said second one-character period;

a generator for generating at least one of characters and graphics, said generator generating a video signal for displaying at least one of characters and graphics in accordance with display data read from said video random access memory;

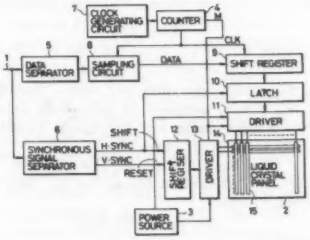
first latch means including a first-in, first-out memory having an input terminal connected to an output terminal of said video random access memory and having an output terminal connected to an input terminal of said generator, for latching first display data read from said video random access memory in the first half of said second one-character display period to supply the first display data to said generator in said first one-character display period; and

second latch means including a first-in, first-out memory having an input terminal connected to the output terminal of said video random access memory and having an output terminal connected to the input terminal of said generator, for latching second display data read from said video random access memory in the second half of said second one-character display period to supply the second display data to said generator in said second one-character display period.

4,556,880
LIQUID CRYSTAL DISPLAY APPARATUS

Tatsuzo Hamada, Hatano, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 1, 1982, Ser. No. 438,257
Claims priority, application Japan, Nov. 24, 1981, 56-188133
Int. Cl.⁴ G09G 3/36
U.S. Cl. 340—814 **7 Claims**



1. A liquid crystal display apparatus for displaying data on a liquid crystal panel, comprising:

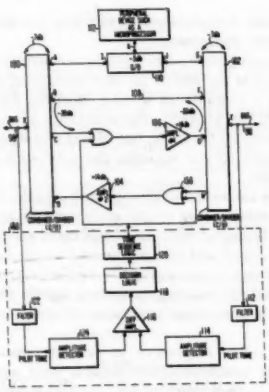
a power source for supplying predetermined voltages;
electrodes arrayed in a predetermined manner in said liquid crystal panel;
synchronizing signal supplying means which produces synchronizing signals;
clock generating means which generates clock signals maintaining a predetermined period; and
driving means for generating an a-c voltage in accordance with said predetermined voltages from said power source and for driving said electrodes therewith, said driving means being responsive to said synchronizing signals from said synchronizing signal supplying means for driving said electrodes with an a-c voltage in synchronism with said synchronizing signals, said driving means being responsive to said clock signals from said clock generating means for driving said electrodes with an a-c voltage in accordance therewith in the absence of said synchronizing signals from said synchronizing signal supply means.

4,556,881

ACTIVE, BI-DIRECTIONAL BUS TAP

Philip C. Basile, Turnersville, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Sep. 12, 1983, Ser. No. 531,281
Int. Cl.[4] H01H *67/00*
U.S. Cl. 340—825 **8 Claims**



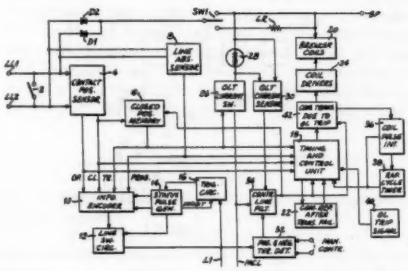
1. In a communication system employing a common bus and a plurality of peripheral devices, a bidirectional bus tap for connecting one of said peripheral devices between first and second portions of said bus, said tap comprising:
first and second combiner/divider networks, each of said combiner/divider networks including first, second and third subsidiary ports and a common port, each of said combiner/divider networks providing at least a predetermined isolation between any two of said subsidiary ports, and providing a first predetermined loss in the coupling of signals in either direction between said common port and any one of said subsidiary ports, said common ports of said first and second combiner/divider networks being coupled to first and second portions, respectively, of said bus;
first amplifier means having an input port coupled to said first subsidiary port of said first combiner/divider network and an output port coupled to said first subsidiary port of said second combiner/divider network, said first amplifier means having a gain of approximately twice said predetermined loss for compensating for the loss occasioned by transmission of signals from said first portion of said bus to said second portion of said bus, but having a gain no greater than said predetermined isolation;
second amplifier means having an input port coupled to said second subsidiary port of said second combiner/divider network and an output port coupled to said second subsidiary port of said first combiner/divider network, said second amplifier means having a gain of approximately twice said predetermined loss for compensating for the loss occasioned by transmission of signals from said second portion of said bus to said first portion of said bus, but having a gain no greater than said predetermined isolation; and
tap means for bidirectionally connecting said one of said peripheral devices to said third ports of said first and second combiner/divider networks.

4,556,882

REMOTE CONTROL CIRCUIT BREAKER SYSTEM WITH ON-OFF-TRIPPED-PROBLEM STATUS STORAGE AND INDICATION

Josef Brifman, Haifa, Israel; M. Frank Chacon, Elkmont, Ala.; Richard F. Schmerda, Oak Creek, and Frank E. Smith, Oconomowoc, both of Wis., assignors to Eaton Corporation, Cleveland, Ohio

Filed Nov. 15, 1982, Ser. No. 441,973
Int. Cl.[4] H04Q *9/00*
U.S. Cl. 340—825.06 **31 Claims**



1. A remote control circuit breaker system comprising:
a plurality of remote control circuit breakers, each having contacts for controlling connection of power from an electric power supply source over a power line to a respective load;
an electronic control unit for each said circuit breaker;
a local I/O circuit arranged to communicate with said plurality of remote control circuit breakers' electronic control units;
control lines comprising conductor pair connections between said I/O circuit and respective ones of said remote breaker's electronic control units over which said communication is conducted;
a central processing unit arranged to communicate with said I/O circuit so as to transmit close and open commands for said breakers thereto and to read therefrom status data that is stored therein;
means in said I/O circuit for transmitting said close and open commands over said control lines to the respective electronic control units;
four-state sensing means in each said electronic control unit for sensing the closed, open or tripped status of the associated breaker contacts and a problem status of said power line or said control line and means for generating data respectively indicative thereof;
means including said sensing means in each said electronic control unit for applying a close or open operate signal to the respective breaker in response to said commands whenever the command coming over the corresponding control line differs from the sensed closed or open status of the respective breaker contacts;
means in said I/O circuit for periodically transmitting status

information request pulses over said control lines to the respective electronic control units in sequence;

means in each said electronic control unit responsive to the respective information request pulse for tripping its data generating means into operation and to transmit said four-state status indicative data back to said I/O circuit;

and means in said I/O circuit for receiving and storing said four-state status indicative data so as to make it available for reading by said central processing unit.

4,556,883

TRANSMITTING AND RECEIVING CIRCUIT FOR AN APPARATUS FOR THE AUTOMATIC IDENTIFICATION OF OBJECTS AND/OR LIVING ORGANISMS

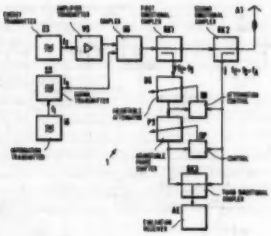
Rainer Strietzel, Heidelberg, Fed. Rep. of Germany, assignor to Brown, Boveri & Cie AG, Mannheim, Fed. Rep. of Germany

Filed Dec. 20, 1982, Ser. No. 451,481

Claims priority, application Fed. Rep. of Germany, Dec. 21, 1981, 3150704

Int. Cl.⁴ H04Q *9/00*; G01S *13/78*; H04B *1/59*

U.S. Cl. 340—825.54 **8 Claims**



1. Transmitting and receiving circuit for an apparatus for the automatic identification of objects and/or living organisms, comprising a stationary interrogator and a transponder fastened to the object or living organism to be identified, said interrogator including an energy transmitter, a signal transmitter, a first directional coupler connected to said energy and signal transmitters for receiving outgoing waves from said transmitters and for decoupling a first energy component from said outgoing waves, a first transmitting and receiving antenna, a second directional coupler being connected in series with said first directional coupler and being connected to said first transmitting and receiving antenna for receiving returning waves from said transponder and for decoupling a second energy component from said returning waves, an adjustable attenuator connected to said first directional decoupler for receiving said first energy component, an adjustable phase shifter connected to said adjustable attenuator for receiving said first energy component, a third directional coupler having a first input connected to said adjustable phase shifter for receiving said first energy component, a second input connected to said second directional coupler for directly receiving said second energy component, and an output, said attenuator and said phase shifter being adjusted for providing a signal at said output of said third directional coupler with a minimum, and an evaluation unit connected to said output of said third directional coupler, and said transponder including an energy receiver, an energy converter connected to said energy receiver, a signal receiver, a signal demodulator connected to said signal receiver, a data processing unit connected to said signal demodulator, a reply transmitter connected to said data processing unit, and a second transmitting and receiving antenna connected to said energy receiver, signal receiver and reply transmitter.

4,556,884

DEPTH DEPENDENT MULTIPLE LOGGING SYSTEM

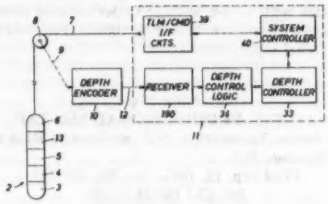
Anthony P. S. Howells; Anthony M. Dienglewicz; Raman Viswanathan, and Jorg A. Angehrn, all of Houston, Tex., assignors to Dresser Industries, Inc., Dallas, Tex.

Continuation of Ser. No. 30,050, Apr. 13, 1979, abandoned, which is a continuation-in-part of Ser. No. 949,592, Oct. 10, 1978, abandoned. This application Mar. 26, 1982, Ser. No. 362,573

The portion of the term of this patent subsequent to Nov. 3, 1998, has been disclaimed.

Int. Cl.⁴ E21B *49/00*; G01V *1/00*

U.S. Cl. 340—860 **14 Claims**



1. Apparatus for investigating subsurface materials traversed by a borehole, comprising:

a well logging tool suspended in and moveable through a borehole at the end of an electrical cable, said tool comprising a plurality of sensing elements for measuring a plurality of physical characteristics of earth materials surrounding a borehole, one of said sensing elements being responsive to the acoustic characteristics of said earth materials;

measuring means for deriving depth signals, said depth signals corresponding to the movement of preselected and regularly spaced intervals of said cable as a function of the movement of said tool within said borehole;

command means responsive to said depth signals for generating and transmitting command signals to said tool for initiating measuring sequences of said acoustic sensing element;

detector means responsive to said command signals for deriving synchronization signals, said synchronization signals corresponding to said measuring sequences of said acoustic sensing elements;

timing means responsive to said synchronization signals for generating timing signal sequences; multiplexer means responsive to said timing signal sequences for sequencing the transmission of said plurality of physical characteristic measurements, said transmission being subsequent to the transmission of measurements from each of said acoustic measuring sequences; and

line driver means for transmitting said sequence of physical chracteristics through said cable to the surface.

4,556,885

SYSTEM FOR DETECTING POSITION OR SPEED

Ryoichi Kurosawa, Tokyo, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kanagawa, Japan

Filed Sep. 7, 1982, Ser. No. 415,182

Claims priority, application Japan, Jan. 26, 1982, 57-9554

Int. Cl.⁴ G05B *1/02*

U.S. Cl. 340—870.25 **17 Claims**

1. A system for detecting position and speed of a body under detection comprising:

a synchro generator having a plurality of primary windings and at least one secondary winding, at least one of (i) said secondary winding and (ii) said plurality of primary windings being coupled to said body,

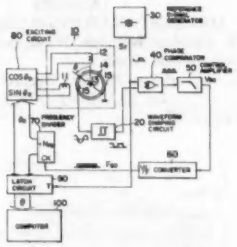
an exciting circuit for providing exciting current to said primary windings,

said secondary winding inducing a signal when said primary windings are excited,

a reference signal generator for providing a reference signal of a predetermined frequency,

first means responsive to the reference signal and the induced signal from said secondary winding, for producing pulses at a frequency which changes depending on the phase difference between the reference signal and the induced signal,

a frequency-divider counting said pulses and producing a first digital signal indicative of the count value at each moment, said first digital signal representing a phase angle of said exciting current,



said exciting circuit being responsive to the first digital signal from the frequency-divider to determine the instantaneous value of the exciting current at each moment,

said synchro generator, said reference signal generator, said first means, said frequency-divider and said exciting circuit forming a phase-locked loop controlling the induced signal so as to be in a predetermined phase-relationship with the reference signal, and

second means responsive to one of (i) a said reference signal generated by said reference signal generator and a said first digital signal produced by said frequency-divider and (ii) pulses produced by said first means, for producing a second digital signal relating to at least one of the position and speed of said body under detection.

4,556,886
PHASE SHIFT TYPE LINEAR POSITION DETECTION DEVICE

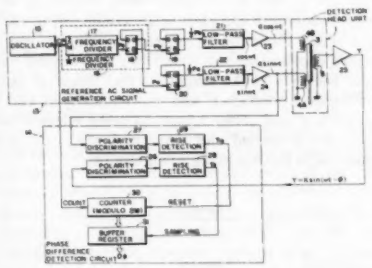
Wataru Shimizu, Fuchu, and Akira Yamashita, Komae, both of Japan, assignors to Kabushiki Kaisha S G, Tokyo, Japan

Filed Feb. 16, 1982, Ser. No. 348,674

Claims priority, application Japan, Feb. 20, 1981, 56-22075[U]

Int. Cl.⁴ G08C *19/06*; G01B *7/14*

U.S. Cl. 340—870.32 **19 Claims**



1. A phase shift type linear position detecton device comprising:

at least two primary coils spaced away from each other by a predetermined distance in the linear displacement direction and excited individually by reference AC signals having a predetermined phase difference 360°/D except 180° or 360°;

secondary coils provided in correspondence to said respective primary coils; and

a plurality of core elements of the same configuration fixed to each other with a predetermined pitch distance P in the linear displacement direction and being capable of relative linear displacement with respect to said primary and secondary coils, and each being capable of producing reluctance or permability, depending upon the position relative to said respective primary coils, in respective magnetic circuits of said respective primary coils;

the distance of spacing between said respective primary coils being P(n±1/D) (where n is any integer) in accordance with the phase difference 360°/D of the exciting AC signals for said respective primary coils and distance P of one pitch of the arrangement of said core elements, whereby the reluctance of a magnetic circuit of each of said primary coils changes cyclically, with a displacement of one pitch of the arrangement of said core elements constituting one cycle thereof and with the reluctance changes of the magnetic circuits of respective primary coils being out of phase by an amount corresponding to the electrical phase difference between respective exciting AC signals, AC signals induced in said respective secondary coils being summed to produce an output AC signal and this output AC signal having an electrical phase depending upon the relative linear position within the range of one pitch of the arrangement of said core elements.

4,556,887
RADAR SYSTEMS

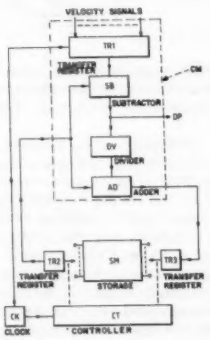
George M. Exeter, Ratho, Scotland, assignor to Ferranti plc, Cheadle, England

Filed Jul. 14, 1982, Ser. No. 398,216

Claims priority, application United Kingdom, Jul. 24, 1981, 8122752

Int. Cl.⁴ G01S *13/58, 13/00*

U.S. Cl. 343—8 **15 Claims**



13. Apparatus for supressing clutter in a radar system of the type that includes signal processing means responsive to radiation reflected from an object for determining the velocity of the object relative to a scanning receiving antenna and for producing velocity signals indicative of the relative velocities of objects in predetermined velocity ranges, the apparatus comprising means for storing, for each of a plurality of increments of antenna bearing, said velocity signals; means operative during each successive antenna scan and at each of said antenna bearing increments for reading the velocity signals corresponding to the predetermined velocity ranges for such increment which were stored in the storing means during a

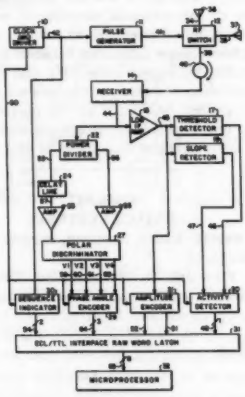
preceding antenna scan; means for subtracting the velocity signals read from the storing means from the velocity signals produced by the signal processing means for such increment to reduce those signals produced by the signal processing means which correspond to objects having substantially constant velocity and to produce output signals; means for combining the output signals with the velocity signals read from the storing means to produce updated velocity signals for such increment; and means for writing said updated velocity signals in said storing means in place of the signals read from said storing means to enable the updated velocity signals to be applied to the signals produced by the signal processing means during the next antenna scan.

4,556,888

POLARIZATION MEASUREMENT SYSTEM AND METHOD

William F. McNaul, Escondido, Calif., assignor to Cubic Corporation, San Diego, Calif.

Filed Jul. 19, 1982, Ser. No. 399,827
Int. Cl.⁴ H01Q *21/06, 21/24;* H04B *7/10*
U.S. Cl. 343—362 **16 Claims**



1. A system for processing two coherent RF signals respectively provided from two differently oriented receivers of RF radiation, to measure the polarization of the received radiation, comprising

means for combining the two received signals in a predetermined repetitive sequence into a single combined signal, each repetition of said sequence providing said combined signal with one of the two received signals for a first predetermined period followed by the other of the two received signals for a second predetermined period that is an integer multiple of the first predetermined period;

means coupled to the combining means for determining the relative amplitude of the two received signals by delaying the combined signal by one first predetermine period and comparing the delayed and undelayed combined signals so as to provide relative amplitude indication signals;

means coupled to the combining means for determining the relative phase of the two received signals by dividing the combined signals into two parts, delaying one part of the divided signal for a third predetermined period equal in duration to said first predetermined period, processing the delayed and undelayed divided signals to provide a combination of signals having amplitudes that are a function of the relative phase of the two received signals, and encoding said combination of signals so as to provide a relative phase indication signal; and

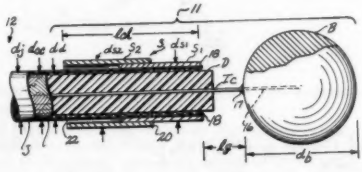
means coupled to the relative amplitude determining means and the relative phase determining means for processing the relative amplitude indication signals and the relative phase indication signal by sampling the indication signals at least once during successive sample intervals occurring contemporaneously with said first predetermined period and each integer multiple of said first predetermined period in said second predetermined period for each repetition of said sequence and comparing the pattern of the samples with a predetermined pattern so as to provide an indication of the polarization of the received radiation.

4,556,889

AIRCRAFT TRAILING BALL ANTENNA

Walter E. Buehler, Issaquah, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Sep. 30, 1983, Ser. No. 537,845
Int. Cl.⁴ H01Q *1/30, 15/24*
U.S. Cl. 343—707 **5 Claims**



1. A transportable antenna comprising:

a movable transport;

mounting means carried by said transport for deploying a coaxial transmission line to serve as an antenna feed, said coaxial transmission line having inner and outer conductors separated by a dielectric and said coaxial transmission line extending from said transport to a terminated end that is spaced outwardly from said transport, said terminated end of said coaxial transmission line having said inner conductor extended axially beyond a terminus of said outer conductor;

a ball-shaped conductor of diameter d_b having its center aligned with the axis of said coaxial transmission line and being electrically connected to the extended end of said inner conductor so that the outer circumference of said ball-shaped conductor is axially spaced from the terminus of said outer conductor of said coaxial transmission line by a gap length of l_g;

a sleeve choke coaxially mounted on said transmission line adjacent said terminated end thereof, the circumference of one end of said sleeve choke being positioned in radial registration with and electrically connected to the terminus of said outer conductor, and the opposite end of said sleeve choke extending back along said coaxial transmission line by a choke length l_{ch}, said diameter d_b of said ball-shaped conductor, said gap length l_g of said sleeve choke and said choke length l_{ch} being selected with respect to a given midband wavelength of $\lambda_{midband}$ in accordance with the following relationships:

$$\frac{\lambda_{midband}}{4} < d_b < \frac{5\lambda_{midband}}{8};$$

$$\frac{\lambda_{midband}}{16} < l_g < \frac{\lambda_{midband}}{8}; \text{ and,}$$

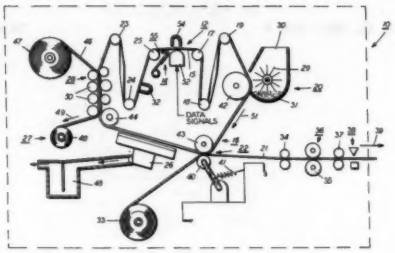
$$l_{ch} \cong \lambda_{midband}.$$

4,556,890

CLEANING APPARATUS FOR A MAGNETOGRAPHIC RECORDING HEAD

Herman A. Hermanson, Penfield, and Almon P. Fisher, Rochester, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Dec. 8, 1983, Ser. No. 559,548
Int. Cl.[4] G01D *15/12*
U.S. Cl. 346—74.4 6 Claims



1. Apparatus for cleaning toner particles from a stationary recording head in a magnetographic printing device of the type having a movable magnetic belt which has on one surface thereof a magnetizable layer for receiving latent magnetic images from said recording head and which moves consecutively after imaging through stationary printing processing stations, the cleaning apparatus comprising:

a cleaning element having a flexible, woven, screen-like configuration of an electrically non-conductive material with openings therethrough, the element having first and second ends, the first end being attached to a rotatably mounted spool and a major portion of said element being wound thereon;

a guide plate located upstream of the recording head and adjacent a nip formed by the movable magnetic belt and the recording head, the guide plate being for supporting the loose second end of the cleaning element while the cleaning element is wound on the spool;

means for periodically rotating the spool in a direction substantially parallel with the moving direction of the magnetic belt to drive the cleaning element second end into and through the nip;

means for rotating the spool in an opposite direction to rewind the cleaning element thereon each time the cleaning element second end is inserted through said nip and to return the loose second end to the guide plate, so that the portion of the cleaning element which enters the nip scrubs the toner particles from the recording head during entry and withdrawal without wearing or damaging the magnetizable surface of the magnetic belt; and

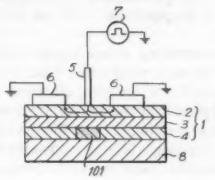
means for laterally moving the cleaning element after insertion thereof through the nip, said lateral movement being completed either prior to withdrawal of the cleaning element from the nip to impose an additional scrubbing action perpendicular to the moving direction of the magnetic belt or during said withdrawal to impose an additional net scrubbing direction that is at an acute angle with the moving direction of the magnetic belt, so that the cleaning element provides a combination of scrubbing directions each time the cleaning element is inserted through and withdrawn from said nip.

4,556,891

PRINTING APPARATUS AND METHOD

Yoshikazu Matsushita; Masaki Takei; Masatoshi Yonekubo, and Tsutomu Nishiwaki, all of Suwa, Japan, assignors to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed Mar. 16, 1984, Ser. No. 590,087
Claims priority, application Japan, Mar. 18, 1983, 58-45588; Jan. 25, 1984, 59-11368
Int. Cl.[4] G01D *15/10*
U.S. Cl. 346—76 PH 20 Claims



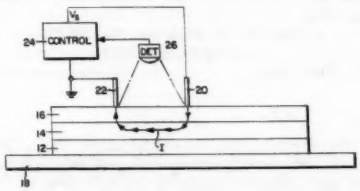
1. A printing apparatus for printing on a record medium comprising an ink sheet having an ink layer with heat-fusable ink thereon facing said record medium and a resistive layer, a print head having at least a pair of opposed electrodes in contact with said resistive layer, driving circuit means coupled to said pair of opposed electrodes for applying a voltage to said pair of opposed electrodes, said pair of opposed electrodes when said voltage is applied thereto causing a current to flow through said ink sheet to heat said ink layer so that said ink thereon is transferred to said record medium, control means coupled to said driving circuit means for controlling the voltage applied by said driving circuit means, said control means including a gray scale signal generating means for producing a gray scale signal and a pulse width setting means for modulating the pulse width of the voltage applied by said driving circuit means in response to said gray scale signal.

4,556,892

THERMAL TRANSFER RECORDING SYSTEM AND METHOD

Irving Erlichman, Wayland, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Mar. 28, 1985, Ser. No. 717,121
Int. Cl.[4] B41M *5/70*
U.S. Cl. 346—76 PH 11 Claims



1. A thermal transfer recording system for recording an image represented by pixel areas of varied density on an ink receiving sheet utilizing a thermal transfer ribbon having a thermally transferable ink layer on one side, a thermally sensitive and electro-conductive indicator layer on a side opposite the one side, and a resistive layer for generating heat in response to electrical current flow therein, the resistive layer being located between and in thermally conductive relation to both the ink and indicator layers for applying heat to the ink layer to cause transfer of ink to the receiving sheet for recording a dot in a selected pixel area and for applying heat to the indicator layer to cause the formation of an optically detect-

able corresponding mark, in a corresponding pixel area section of the indicator layer, which is proportional to the size of the recorded dot such that the density of the corresponding pixel area section is indicative of the density of the pixel area in which the dot is recorded, the ink and indicator layers being configured such that the size of a recorded dot and corresponding mark increase with increased amounts of heat applied to form such a dot and mark, said system comprising:

means for supporting such an ink receiving sheet;

means for supporting such a ribbon with the ink layer in operative engagement with the receiving sheet for ink transfer;

means for receiving image signals indicative of a desired density for each pixel area of the desired image;

means operable for applying electrical recording signals to selected pixel area sections of the indicator layer to establish heat generating current flow in the resistive layer and thereby forming a dot in each selected pixel area and a corresponding mark in each corresponding pixel area section of the indicator layer, said signal applying means being configured so as not to block access to the corresponding pixel area sections of the indicator layer for optical monitoring purposes;

means for optically monitoring the density of the corresponding pixel area sections of the indicator layer and for providing density signals indicative of the density of each selected pixel area;

means for comparing said density signals with said image signals and for providing density comparison value signals for each selected pixel area; and

means for operating said electrical signal applying means, said operating means initially being responsive to said image signals for regulating an initial application of heat to sections of the ribbon corresponding to the selected pixel areas to form for each pixel area a dot and corresponding mark having an initial size smaller than necessary to achieve its said desired density and, thereafter, being responsive to said density comparison value signals for regulating further application of heat to progressively increase dot and corresponding mark size until a predetermined value of density comparison is achieved for each selected pixel area.

4,556,893

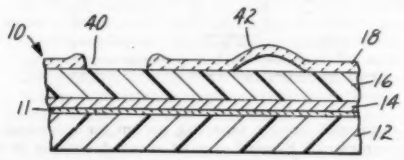
OPTICAL RECORDING MEDIUM OF HIGH SENSITIVITY

Thomas A. Rinehart, St. Paul, Minn.; Richard F. Willson, Hudson, and Vaughn W. Halling, River Falls, both of Wis., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Feb. 15, 1983, Ser. No. 466,435

Int. Cl.[4] G01D *15/34*

U.S. Cl. 346—135.1 **17 Claims**



1. An optical recording medium for use in an optical recording apparatus having a laser diode emitting at a wavelength in the range of 700–900 nm, said medium comprising an optically-flat, disk-shaped, polymeric or glass substrate and a continuous, light-absorbing layer having a thickness of 1–60 nm and in which information is recordable in the form of discrete features creatable by a focused, modulated beam from said laser diode, wherein the improvement comprises:

said light-absorbing layer comprises a carbide of a metal selected from iron, chromium or alloys therebetween.

4,556,894

INK-JET TYPE PRINTER AND A FUNCTION RESTORATION SUCTION DEVICE

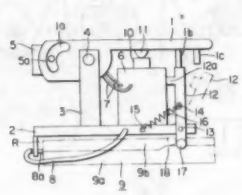
Koji Terasawa, Mitaka, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 491,994, May 5, 1983, abandoned. This application Nov. 5, 1984, Ser. No. 668,673

Claims priority, application Japan, May 11, 1982, 57-77545; Jun. 1, 1982, 57-94594

Int. Cl.[4] G01D *15/18*

U.S. Cl. 346—140 R **14 Claims**



1. An ink-jet type printer comprising means for retrieving an ink from the ink discharging tip of a recording head, a vessel receiving chamber for detachably receiving a vessel in which the ink is contained, and means for detecting whether or not said ink vessel is mounted in said vessel receiving chamber and for inhibiting the actuation of said retrieving means if it is detected that said vessel is not set within said vessel receiving chamber.

4,556,895

FIELD-EFFECT TRANSISTOR HAVING A CHANNEL REGION OF A GROUP III-V COMPOUND SEMICONDUCTOR AND A GROUP IV SEMICONDUCTOR

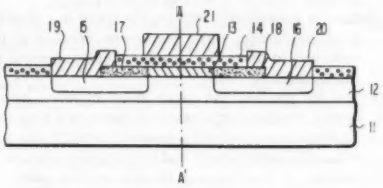
Keiichi Ohata, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Apr. 26, 1983, Ser. No. 488,878

Claims priority, application Japan, Apr. 28, 1982, 57-71981

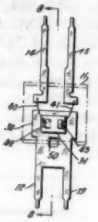
Int. Cl.[4] H01L *29/78, 29/12, 29/161, 27/02*

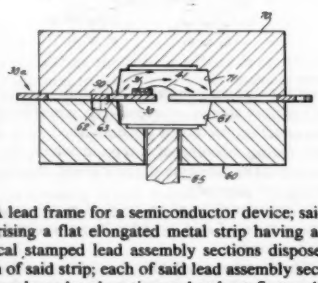
U.S. Cl. 357—23.7 **25 Claims**



1. A field-effect transistor comprising: a channel portion including a first semiconductor layer of an intrinsic semiconductor having a first electron affinity and a first energy gap and a second semiconductor layer of an intrinsic semiconductor having a second electron affinity and a second energy gap, said second semiconductor layer formed over said first semiconductor layer, said second electron affinity being smaller than said first electron affinity and the sum of said second electron affinity and said second energy gap being smaller than the sum of said first electron affinity and said first energy gap; a source region and a drain region in electrical contact with said channel portion and formed separated from each other; and a gate means for applying an electric field to said channel portion.

4,556,896
LEAD FRAME STRUCTURE
Dennis Meddles, Torrance, Calif., assignor to International Rectifier Corporation, Los Angeles, Calif.
Filed Aug. 30, 1982, Ser. No. 412,928
Int. Cl.[4] H01L *23/30, 23/12, 23/48*
U.S. Cl. 357—70 13 Claims

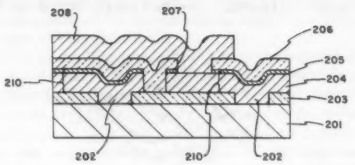




1. A lead frame for a semiconductor device; said lead frame comprising a flat elongated metal strip having a plurality of identical stamped lead assembly sections disposed along the length of said strip; each of said lead assembly sections including an enlarged pad section and at least first and second lead sections, each of said enlarged pad sections and said first and second lead sections being integral parts of said strip and being joined together within said strip by regions which are severable in order to permit electrical isolation of said pad section and said first and second lead sections from one another; each of said enlarged pad sections having an upper surface area for electrically and thermally receiving one surface of a semiconductor chip; each of said first and second lead sections having free ends which define wire-receiving areas for receiving electrical leads which are to be connected to the surface of respective ones of said semiconductor chips which is opposite to its said one surface; and a respective single molding gate opening of sufficient size to enable injection of plastic therethrough extending through each of said enlarged pad sections at a location laterally removed from their said chip-receiving upper surface areas; each of said molding gate openings being located at a region which spans an edge of respective plastic housings which are to be molded onto said lead frame.

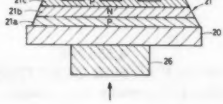
4,556,897
TITANIUM COATED ALUMINUM LEADS
Masaharu Yorikane, and Noboru Ohseki, both of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan
Filed Feb. 7, 1983, Ser. No. 464,418
Claims priority, application Japan, Feb. 9, 1982, 57-19092
Int. Cl.[4] H01L *23/50*
U.S. Cl. 357—71 2 Claims

1. A semiconductor device comprising a semiconductor substrate, a silicon oxide film formed on a major surface of said substrate and having a first aperture reaching a part of said substrate, a first wiring comprising a first aluminum layer formed on said silicon oxide film and connected through said first aperture to said part of said substrate and a titanium film provided on an upper surface of said first aluminum layer except on a contact portion of said first aluminum layer, said titanium film being also provided on a side surface of said first aluminum layer, a silicon nitride film covering said first wiring and having a second aperture reaching said first aluminum



layer and exposing said contact portion of first aluminum layer, and a second wiring of a second aluminum layer provided on said silicon nitride film and connected directly to said contact portion of said first aluminum layer of said first wiring.

4,556,898
SEMICONDUCTOR DEVICE
Hiroyasu Hagino, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Dec. 27, 1983, Ser. No. 565,740
Claims priority, application Japan, Jan. 20, 1983, 58-9129
Int. Cl.[4] H01L *23/48, 29/46, 29/54, 29/62*
U.S. Cl. 357—71 14 Claims



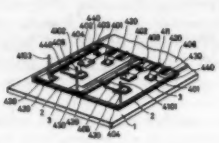
1. A semiconductor device with improvements for avoiding a short circuit between a machined cathode contact of said device, wherein said contact may have burrs on its edges, and any element of said semiconductor device other than its cathode, wherein the semiconductor device comprises at least said cathode and an anode, the cathode being divided into a plurality of islands, and wherein the cathode contact comprises a first machined first conductor, which may have burrs on its edges, that has all its edges bent upwards so that the first conductor is cup-shaped, and a second conductor disposed in the cup of the first conductor and in electrical contact with it, wherein the bottom of the cupped first conductor contacts the cathode of semiconductor device.

4,556,899
INSULATED TYPE SEMICONDUCTOR DEVICES
Yasutoshi Kurihara, Katsuta; Yoshihiro Suzuki, Hitachi; Michio Ooue, Hitachi; Hiroaki Hachino, Hitachi, and Mitsuo Yanagi, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Jun. 7, 1982, Ser. No. 386,071
Claims priority, application Japan, Jun. 5, 1981, 56-85741
Int. Cl.[4] H01L *23/14, 23/36, 23/54*
U.S. Cl. 357—80 12 Claims

1. A semiconductor device comprising:
a support member;
an insulating member disposed on said support member;
a metal member soldered on said insulating member; and
at least one circuit element including a semiconductor substrate soldered on said metal member,
wherein the metal member is a composite metal member

comprising at least two different kinds of metal layers bonded to each other, and

wherein the thermal expansion coefficient of said composite metal member as a whole (α_M) is adjusted in a range between the thermal expansion coefficient of the insulating member (α_I) and that of the semiconductor substrate (α_S) to reduce deterioration of the solder between the metal member and the insulating member and between the semiconductor substrate and the metal member during thermal cycles which occur in the semiconductor device during its operation.

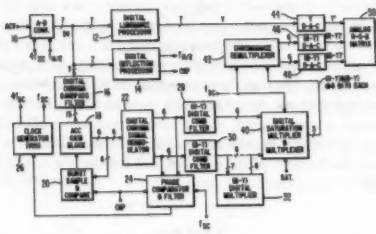


4,556,900

SCALING DEVICE AS FOR QUANTIZED B-Y SIGNAL

Donald H. Willis, Indianapolis, Ind., assignor to RCA Corporation, Princeton, N.J.

Filed May 25, 1983, Ser. No. 498,016
Int. Cl.⁴ H04N *9/50, 9/32, 5/21, 9/52*
U.S. Cl. 358—23 **20 Claims**



1. Signal processing apparatus comprising:

a source of substantially uniformly quantized signals having N possible levels, wherein the number of levels of said quantized signals utilized is KN, where N is a positive integer and K is a number between zero and unity;

first processing means, coupled to said source, for processing said quantized signals, said processing including at least one operation producing modified quantized signals having more than N possible levels;

scaling means, coupled to said processing means, for scaling said modified quantized signals by a predetermined factor having a value greater than unity but not exceeding 1/K; and

second processing means, coupled to said scaling means, for developing output signals having not more than N possible levels in response to said scaled modified quantized signals,

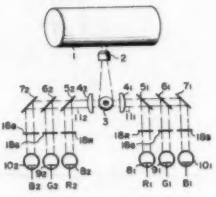
whereby said output signals utilize a number of levels exceeding said KN number of levels.

4,556,901

METHOD FOR SCANNING A PLURALITY OF SCANNING LINES AT THE SAME TIME

Takashi Sakamoto, Kyoto, Japan, assignor to Dainippon Screen Seizo Kabushiki Kaisha, Kyoto, Japan

Filed Jan. 19, 1983, Ser. No. 459,157
Claims priority, application Japan, Jan. 19, 1982, 57-6650
Int. Cl.⁴ H04N *1/46, 3/06, 1/04, 1/06*
U.S. Cl. 358—75 **4 Claims**



1. A method for scanning an original picture photo-electrically to obtain picture signals consecutively, whereby recording for a reproduction picture is accomplished in a picture scanning reproducing machine of a type in which the outer surface of an original picture cylinder is scanned, the improvement comprising the steps of:

scanning the outer surface of an original picture cylinder, said outer surface of said cylinder being scanned while said cylinder rotates;

scanning at least two scanning lines per one rotation of said original picture cylinder to pick up a number of picture signals corresponding to the number of scanned lines;

processing the picture signals obtained during said scanning from at least one said scanned line from optical to corresponding R, G and B electrical signals independently; and

processing picture information obtained from the circumferential areas of a plurality of adjacent picture elements from optical to electrical signals, said picture information being picked up as unsharp signals concurrently with said scanning;

processing electronically said R,G and B signals to C,Y,M and K signals, and

modifying at least a portion of said processed R, G and B signals by combining with signals derived from said concurrent unsharp signals.

4,556,902

SYSTEM AND METHOD FOR MEASURING THE AREA AND DIMENSIONS OF APERTURES IN AN OPAQUE MEDIUM

Frank S. Krufka, Mount Joy, Pa., assignor to RCA Corporation, Princeton, N.J.

Filed Jan. 19, 1984, Ser. No. 572,150
Int. Cl.⁴ H04N *7/18*
U.S. Cl. 358—107 **5 Claims**

1. A system for measuring the average area and dimensions of apertures in an apertured member comprising:

an energy source for passing energy through said apertures;

a camera having an array of pixels responsive to said energy and a lensing arrangement for focusing said energy and for selectively scanning said energy in a plurality of scan lines over said pixels whereby pixels are charged to one level when said energy passes through one of said apertures and to another level when said energy is blocked by the material between said apertures;

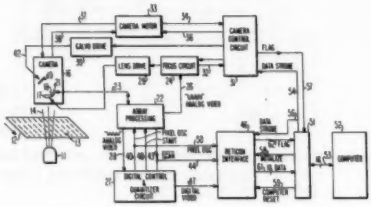
means for rotating said camera with respect to said apertures

whereby said apertures are scanned in orthogonal first and second directions;

means responsive to said first and second charge levels for providing an analog signal having first and second voltage levels respectively indicative of said first and second charge levels;

means for receiving said analog signal and providing a digital signal representative of said analog signal;

means responsive to said digital signal for storing the digital signal for each of said scan lines as a row and the digital signals for successive scan lines as columns;



means for adding the pulse width of every pulse in one of said columns to obtain a first total pulse dimension when scanning occurs in said first direction;

means for dividing said first total pulse dimension by a preselected number to obtain a first typical pulse dimension;

means for adding the pulse width of every pulse in one of said columns to obtain a second total pulse dimension when scanning occurs in said second direction;

means for dividing said second total pulse dimension by a preselected number to obtain a second typical pulse dimension; and

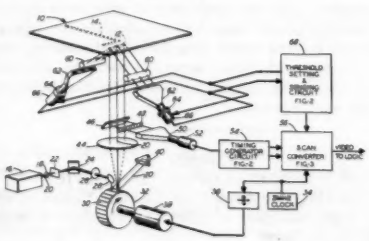
means for multiplying said first and second typical pulse dimensions to obtain a typical aperture area.

4,556,903

INSPECTION SCANNING SYSTEM

Frank H. Blitchington, and David E. Haught, both of Richmond, Va., assignors to AT&T Technologies, Inc., New York, N.Y.

Filed Dec. 20, 1983, Ser. No. 563,482
Int. Cl.[4] H04N *7/18, 7/00, 1/02*
U.S. Cl. 358—106 **9 Claims**



1. An apparatus for generating a binary signal representative of the presence/absence of conductive material having physical dimensions of size and spacing in a pattern on the surface of a fluorescent substrate, comprising:

a helium-cadmium laser generating a spot of blue light, said spot having a diameter smaller than the smallest physical dimension of the pattern of conductive material;

means for relatively scanning the spot of laser light in a raster pattern across a field to be examined on the surface of the substrate;

means for sensing fluorescent light resulting from the impingement of the scanned laser light over the areas of the substrate that are not covered with conductive material and for disregarding the light resulting from impingement of the scanned light over the areas of the substrate that are covered with conductive material;

means for generating a stream of sensing sampling signals representative of the instantaneous scanning location of the spot of blue laser light;

means for controlling the sensitivity of the sensing means based upon the level of fluorescence of the surface of the substrate to maintain a substantially constant signal level indicative of fluorescence at the surface of the substrate;

means for generating a stream of binary video signals based upon the combination of the ratio of the instantaneous sensed signal and the signal representative of the level of fluorescence of the substrate and the sensing scanning signals; and

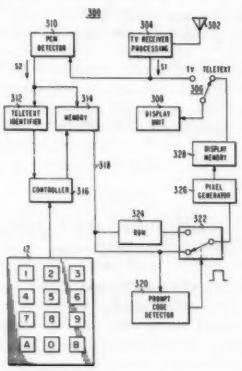
means for converting an intermittant stream of binary video signals at a higher frequency of the sensing sampling signals to a substantially continuous stream of binary video signals at a lower frequency.

4,556,904

TELETEXT SYSTEM HAVING USER PROMPT COMMANDS

Robert A. Monat, Indianapolis, Ind., assignor to RCA Corporation, Princeton, N.J.

Filed Mar. 4, 1983, Ser. No. 472,417
Int. Cl.[4] H04N *7/04*
U.S. Cl. 358—147 **5 Claims**



1. A teletext receiver for receiving teletext signals and for allowing ready use of a remote control having arbitrarily designated symbol keys, comprising:

teletext signal receiving means for receiving coded teletext signals;

first memory means coupled to said teletext signal receiving means for storing in coded form signals representative of prompting and non-prompting symbols to be displayed;

detector means coupled to said first memory means for generating a control signal that is indicative of the presence of a prompting signal to be displayed;

controllable code conversion means coupled to said detector means for converting said coded signals representative of prompting symbols to be displayed into coded signals representative of other symbols under the control of said control signal and for passing unchanged those coded signals representative of non-prompting symbols, said other symbols being symbols identifying the symbol keys of the remote control with which the receiver is associated;

coded-symbol-to-pixel conversion means coupled to said controllable code conversion means for receiving said

coded signals to be displayed and for generating pixel intensity information therefrom;

second memory means coupled to said coded-symbol-to-pixel conversion means for storing said pixel intensity information; and

display means coupled to said second memory means for displaying said non-prompting symbols and said converted prompting symbols corresponding with said other symbols identifying said symbol keys of said remote control.

4,556,905

VERTICAL SYNCHRONIZING CONTROL CIRCUIT

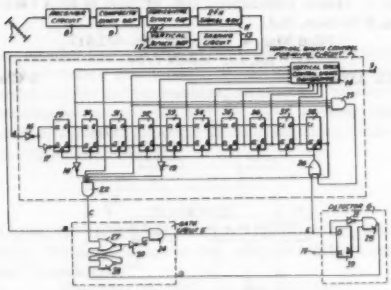
Hiroaki Ikejiri, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed Nov. 10, 1983, Ser. No. 550,652

Claims priority, application Japan, Nov. 11, 1982, 57-197956

Int. Cl.⁴ H04N *5/10*

U.S. Cl. 358—154 **12 Claims**



1. A vertical synchronizing control circuit receiving an external vertical sync signal, comprising:

a vertical sync control signal forming circuit having counter means counting an inputted clock signal and delivering in response to said counting a first control signal and a vertical sync control signal, said control signals having the same frequency as said external vertical sync signal, said control signal forming circuit having a first control terminal and circuit means for synchronizing said vertical sync control signal with said external vertical sync signal;

gate circuit means for controlling passage of said external vertical sync signal, said gate circuit means having a second control terminal which when driven by said first control signal allows said external vertical sync signal to pass through said gate circuit means, and a third control terminal which when driven inhibits said external vertical sync signal from passing;

a detector circuit for detecting the passing of said external vertical sync signal through said gate circuit, said detector circuit delivering a second control signal when said external vertical sync signal is detected passing said gate circuit means, said second control signal being applied to said third control terminal to block said gate circuit means,

said circuit means for synchronizing said vertical sync control signal being input said external vertical sync signal passing through said gate circuit means at said first control terminal of said vertical sync control signal forming circuit, noise in said external signal being excluded from said circuit means for synchronizing when said gate circuit means is blocked.

4,556,906

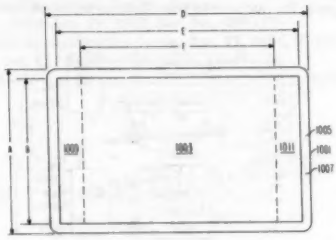
KINESCOPE BLANKING SCHEME FOR WIDE-ASPECT RATIO TELEVISION

Robert A. Dischert, Burlington, N.J., and William H. Meise, Wrightstown, Pa., assignors to RCA Corporation, Princeton, N.J.

Filed Nov. 15, 1983, Ser. No. 551,918

Int. Cl.⁴ H04N *5/223;* **H01J** *29/70, 29/80*

U.S. Cl. 358—180 **3 Claims**



1. A direct view television display apparatus adapted for displaying a horizontal-to-vertical aspect ratio picture that varies from a first aspect ratio of 4:3 to a second aspect ratio greater than 4:3, comprising:

image display means for displaying a picture received by said display apparatus in accordance with the aspect ratio of said received picture, said image display means comprising a direct view cathode ray tube means having a face plate having a horizontal-to-vertical aspect ratio of 4:3;

masking means for masking a top portion, a bottom portion and two side portions of said face plate of said cathode ray tube means such that an active picture display area is provided on said face plate when viewed through said masking means, said active picture display area having vertical and horizontal dimensions corresponding to said second aspect ratio, wherein said second aspect ratio is greater than said first aspect ratio, said masking means masking a greater portion of said cathode ray tube means in a vertical direction of said face plate than in a horizontal direction of said face plate;

selecting means for selecting between said first and said second aspect ratio for displaying said picture received in accordance with the aspect ratio of said received picture on said face plate in said active picture display area; and

picture size control means, coupled to said selecting means for affecting said display apparatus such that the size of the display is changed in a horizontal direction in response to said selecting means.

4,556,907

VIDEO CAMERA OPERATING DEVICE

Shinji Urata; Shigehiko Aoyagi, and Kazuhiro Yamazaki, all of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 18, 1984, Ser. No. 601,534

Claims priority, application Japan, Apr. 30, 1983, 58-65791[U]

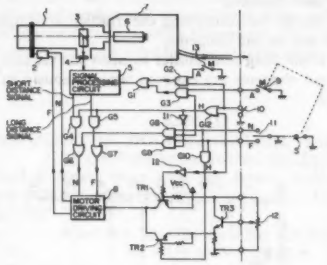
Int. Cl.⁴ H04N *5/30;* **H01J** *29/89*

U.S. Cl. 358—210 **6 Claims**

1. A video camera operating device including a close operating device and a remote operating device, comprising:

means for causing an operating mode selected by an automatic focusing/manual focusing changeover switch of said remote operating device to take precedence over an operating mode selected by an automatic focusing/manual focusing changeover switch of said close operating device; and

driving means for remotely driving a video lens when said automatic focusing/manual focusing switch of said remote operating device is operated at least for a manual focusing mode in a remote operation.

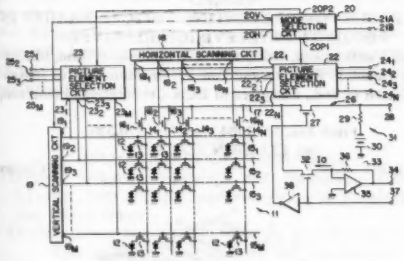


4,556,908

SOLID STATE IMAGE SENSOR

Masatoshi Ida, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Dec. 28, 1982, Ser. No. 454,052
Claims priority, application Japan, Jan. 11, 1982, 57-2498
Int. Cl.[4] H01N *5/26*
U.S. Cl. 358—212 **6 Claims**



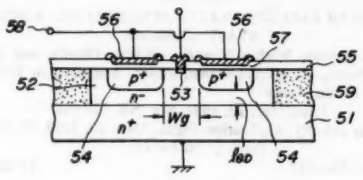
1. A solid state image sensing apparatus comprising:
a solid state image sensing means including a plurality of photoelectric elements two-dimensionally disposed in an imaging plane, said photoelectric elements being capable of issuing a signal charge corresponding to the quantity of incident light thereon when the respective photoelectric elements are selected to issue an output;
first selecting means for sequentially selecting respective ones of said photoelectric elements so as to pickup the signal charge from said selected photoelectric elements in sequence in a first operating mode;
second selecting means for selecting a plurality of specified photoelectric elements from said photoelectric elements so as to pickup the signal charge therefrom simultaneously in a second operating mode; and
mode changing means for selectively supplying a mode selection signal to said first and second selecting means so as to carry out the operating mode selection.

4,556,909

SOLID STATE IMAGE SENSING DEVICE HAVING A NUMBER OF STATIC INDUCTION TRANSISTORS ARRANGED IN A MATRIX FORM

Hidetoshi Yamada, Tokyo, Japan, assignor to Olympus Optical Co. Ltd., Tokyo, Japan

Filed Sep. 4, 1984, Ser. No. 647,169
Claims priority, application Japan, Sep. 9, 1983, 58-165237
Int. Cl.[4] H04N *3/14*
U.S. Cl. 358—212 **11 Claims**



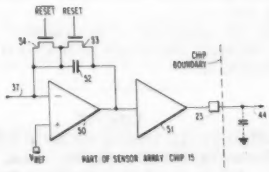
1. A solid state image sensing device comprising
a plurality of row lines;
a plurality of column lines;
means for applying row selection signals successively to said row lines;
means for applying column selection signals successively to said column lines;
a plurality of pixels arranged in a matrix form, each comprising a static induction transistor having one main electrode region connected to a column line, the other main electrode region connected commonly, a channel region disposed between said main electrode regions and a gate electrode region, and a capacitance connected between the gate electrode region and a row line; and
means for biasing reversely said gate electrode region at the time of reading out said pixel.

4,556,910

IMAGE SENSING DEVICE HAVING ON-CHIP FIXED-PATTERN NOISE REDUCING CIRCUIT

Gil Tisue, Los Altos, Calif., assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jan. 5, 1984, Ser. No. 568,319
Int. Cl.[4] H04N *3/15*
U.S. Cl. 358—212 **6 Claims**



1. An image sensing device on a semiconductor chip comprising:
a chip output terminal;
an array of photosensing elements;
means responsive to clocking signals for sequentially coupling outputs of said photosensing elements to an array output terminal, said array output terminal having fixed-pattern noise thereon due to switching transients and induced noise;
means for removing said fixed-pattern noise by integration of the output on said array output terminal over a period corresponding to the period of said clocking signals; and
buffer means, connected between said removing means and

said chip output terminal means, for isolating said chip output terminal from said removing means and from said array output terminal,

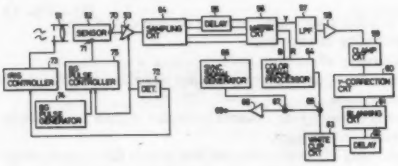
wherein said removing means comprises an operational amplifier integrator having an inverting input coupled to said array output terminal, a first capacitor coupled between an output of said operational amplifier and said inverting input, an FET transistor having a channel coupled in parallel with said first capacitor and a gate coupled to a source of a reset signal.

4,556,911

METHOD AND APPARATUS FOR DRIVING A SOLID STATE CAMERA

Takuya Imaide; Michio Masuda; Akihide Okuda, and Ryuji Nishimura, all of Yokohama, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 23, 1984, Ser. No. 592,955
Claims priority, application Japan, Mar. 23, 1983, 58-47124
Int. Cl.⁴ H04N *3/12*
U.S. Cl. 358—212 **13 Claims**



1. A method for driving a solid state camera which comprises a group of photoelectric converting elements arranged in a two dimensional array, a group of vertical switches, each of which is connected to a corresponding photoelectric converting element, a plurality of vertical signal lines, each of which is connected to a plurality of the photoelectric converting elements through the vertical switches, a charge transfer device including means for transferring signal charges from said photoelectric converting elements in a horizontal direction, coupling means for coupling the vertical signal lines with the charge transfer device, and means for sweeping out undesired excess charges from the vertical signal lines prior to transfer of the signal charges from the photoelectric converting elements to the vertical signal lines, the method comprising the steps of:

detecting a scene illumination level for a scene being viewed by the solid state camera;

comparing the scene illumination level with a predetermined value; and

stopping the sweep out of the undesired excess charges when the scene illumination level is lower than the predetermined value.

4,556,912

SOLID STATE IMAGE PICK-UP DEVICES

Seisuke Yamanaka, Mitaka; Masatoshi Sase, Atsugi; Osamu Yoshioka, Yokohama, and Isao Kajino, Isehara, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Aug. 10, 1983, Ser. No. 521,968
Claims priority, application Japan, Aug. 10, 1982, 57-137861
Int. Cl.⁴ H01N *3/14*
U.S. Cl. 358—213 **4 Claims**

1. A solid state image pick-up device comprising:

first and second photo-sensitive elements corresponding to odd and even fields of a television signal arranged alternately in a matrix;

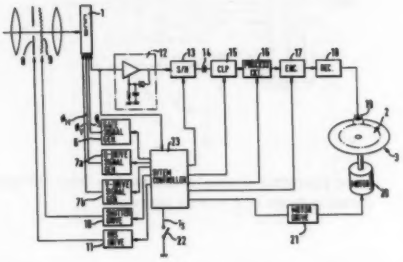
a plurality of vertical shift registers mounted parallel to each other for shifting charges from said first and second photo-sensitive elements;

a plurality of transfer gates respective disposed between said first and second elements and said vertical shift registers for shifting charges from said first and second photo-sensitive elements to said vertical shift registers;

a horizontal shift register coupled to one end of each of said vertical shift registers;

an optical shutter for controlling the irradiation of light on said first and second elements;

means for controlling said shutter to open so that said first and second elements are exposed simultaneously to said light; and



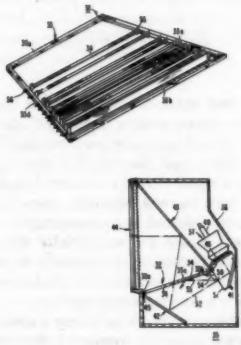
controller means for controlling said transfer gates and said vertical and horizontal shift registers such that the maximum intervals available for charging each of said first and second photo-sensitive elements are the same and have a duration of at least two frame periods, the start times of said charging intervals for said first and second photo-sensitive elements respectively are relatively shifted by a predetermined interval, and the charges from said first and second photo-sensitive elements respectively resulting from said irradiation are read out sequentially after said shutter has closed.

4,556,913

APPARATUS FOR PREVENTING VIRTUAL IMAGES IN PROJECTION TELEVISION RECEIVERS

Bertram VanBreemen, Indianapolis; William L. Wilson, Shelbyville; Duane L. Roberts, and Tom W. Branton, both of Indianapolis, all of Ind., assignors to RCA Corporation, Princeton, N.J.

Filed Jan. 13, 1984, Ser. No. 570,329
Int. Cl.⁴ H04N *5/74, 9/31*
U.S. Cl. 358—237 **11 Claims**



1. In a rear projection television receiver having an image source, first and second mirrors, and a screen, in which light from said image source follows a first light path to said screen that incorporates said first and second mirrors and which

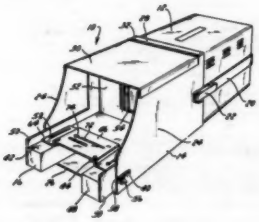
follows a second light path to said screen that bypasses said first and second mirrors, means for occluding said second light path comprising light baffle means disposed within said first light path after said first mirror and before said second mirror and disposed within said second light path, said light baffle means appearing substantially transparent along said first light path and appearing substantially opaque along said second light path.

4,556,914

PHOTOGRAPHIC DOCUMENTATION SYSTEMS FOR CRT OR VIDEO IMAGING SCREENS

Richard K. Vitek, West Allis, and Jeffrey B. Smoot, Sussex, both of Wis., assignors to Fotodyne, Incorporated, New Berlin, Wis.

Filed Sep. 30, 1982, Ser. No. 429,059
Int. Cl.⁴ H04N *5/84*
U.S. Cl. 358—244 **9 Claims**



1. A modular photographic apparatus for producing high resolution photographs of the screen of a CRT or TV monitor, said apparatus including a rigid main housing, means for securing said housing to a TV monitor, carriage means for supporting a camera in said housing in a position to photograph the TV screen, said carriage means includes, a mounting tray, a mounting plate hingedly connected to said mounting tray and means for adjusting the position of the mounting plate on the mounting tray and means for securing said carriage means in said main housing whereby the position of a camera mounted on said plate can be changed slightly to focus on a different portion of the screen.

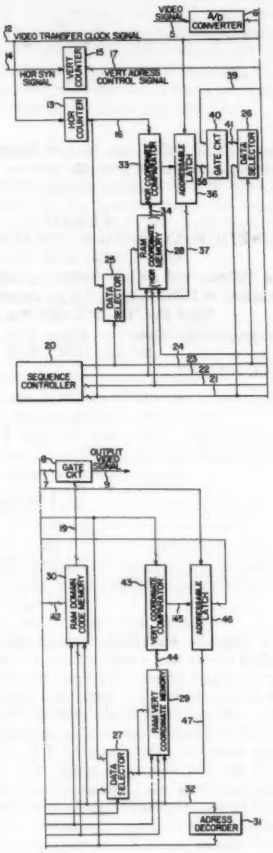
4,556,915

IMAGE REPRODUCTION DEVICE

Takehiko Shibata, Kokubunji, and Yoshikazu Yokomizo, Kawagoe, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 350,607, Feb. 22, 1982, abandoned. This application Jul. 31, 1984, Ser. No. 636,237
Claims priority, application Japan, Mar. 5, 1981, 56-30468
Int. Cl.⁴ H04N *1/40*
U.S. Cl. 358—280 **11 Claims**

1. An image reproduction device comprising:
means for electrically reading an original image to generate a video signal;
means for manually entering a plurality of coordinate data to designate a desired domain of the original;
first storage means for storing said plurality of coordinate data entered via said entering means, said first storage means having a plurality of memory portions;
means for controlling said first storage means so as to store each of said plurality of coordinate data entered via said entering means in an associated one of said memory portions;
means for selecting an image within the domain designated by said entering means or an image outside of said domain;
second storage means for storing selection status information of the image; and
means for processing the video signal generated from said reading means such that, in accordance with the content of said first and second storage means, the video signal representing the image selected by said selecting means is



converted into a specific signal, and the video signal representing the image which is not selected is derived as it is, without being converted into the specific signal.

4,556,916

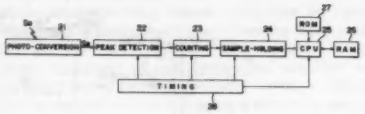
PICTURE IMAGE DISCRIMINATING APPARATUS

Masahiko Matsunawa, Hachioji, Japan, assignor to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Dec. 21, 1982, Ser. No. 452,027
Claims priority, application Japan, Dec. 26, 1981, 56-213902; Dec. 28, 1981, 56-213826
Int. Cl.⁴ H04N *1/40*
U.S. Cl. 358—282 **6 Claims**

1. In a picture image discriminating apparatus which operates for forming a picture signal corresponding to a light signal obtained through scanning a document and processing said picture signal for picture image discrimination, the improvement characterized in that it comprises a differentiating circuit to differentiate a time series output of the picture signal obtainable according to said light signal, a binary-coding circuit to compare an output signal from the differentiating circuit with a specific level and output a binary pulse signal, a counter to

count an output pulse from the binary-coding circuit, means for comparing a pulse number counted by the counter with a



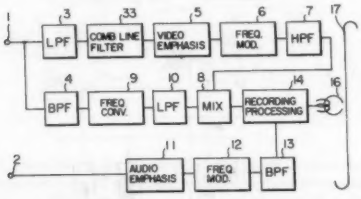
predetermined value, and picture images are discriminated according to an output from the counter.

4,556,917

MAGNETIC RECORDING/REPRODUCING APPARATUS FOR VIDEO AND SOUND

Akira Shibata, and Keiichi Komatsu, both of Katsuta, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 15, 1983, Ser. No. 466,479
Claims priority, application Japan, Feb. 17, 1982, 57-22701
Int. Cl.⁴ H04N *5/78*
U.S. Cl. 358—343 **8 Claims**



1. A magnetic recording/reproducing apparatus having a recording circuit and a reproducing circuit, in which an FM luminance signal obtained by frequency-modulating the luminance carrier signal by a luminance signal of a color video signal, a chrominance signal obtained by converting a frequency of a subcarrier signal of an amplitude-modulated chrominance signal to a frequency band lower than a lower side band of the FM luminance signal, and an FM aural signal which is positioned in a frequency abnd between the lower side band of the FM luminance signal and an upper side band of the chrominance signal and is obtained by frequency-modulating an aural carrier signal by an aural signal, are magnetically recorded in a frequency-multiplexed form as a composite signal on the same track of a magnetic tape and the recorded luminance signal, chrominance signal and FM aural signal are reproduced from the track of the magnetic tape, said recording circuit comprising:

a lumimance signal processing circuit including luminance signal separation means for separating said luminance signal from said color video signal, a comb line filter for deleting said chrominance signal contained in said luminance signal, and a first frequency-modulator for frequency-modulating said luminance carrier signal with said luminance signal to obtain said FM luminance signal;

a chrominance signal processing circuit including chrominance signal separation means for separating said chrominance signal from said color video signal, and a frequency converter supplied with an output signal of said chrominance signal separation means for frequency-converting the frequency of a subcarrier signal of said chrominance signal into the frequency band lower than the lower side band of said FM luminance signal;

an aural signal processing circuit including an aural signal input terminal to which said aural signal is applied, and a second frequency-modulator for frequency-modulating said aural carrier signal by said aural signal to obtain said FM aural signal; and

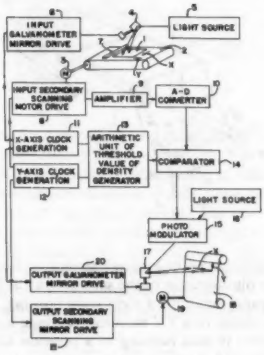
a mixing circuit supplied with each output signal of said luminance signal processing circuit, chrominance signal processing circuit and aural signal processing circuit for frequency-multiplexing said FM luminance signal, chrominance signal and FM aural signal to provide a frequency-multiplexed composite signal for magnetic recording on the same track of the magnetic tape.

4,556,918

METHOD AND APPARATUS FOR GENERATING SCREENED HALFTONE IMAGES

Taro Yamazaki, Hyogo; Masashi Okamoto, Akashi; Tokio Iizuka, Yokohama; Norishige Tsukada, Matsudo, and Kenji Okamori, Tokyo, all of Japan, assignors to Kabushiki Kaisha Sakata Shokai, Osaka, Japan

Filed Dec. 21, 1983, Ser. No. 564,235
Claims priority, application Japan, Dec. 27, 1982, 57-230759
Int. Cl.⁴ H04N *1/40, 1/22*
U.S. Cl. 358—283 **4 Claims**



1. A method for generating screened halftone images in order to reproduce an original, which comprises an area of halftone dots with desired periodicity and tone reproducibility, subdividing said area into minute cells, setting address values (X, Y) for each minute cell, computing out the threshold value of density for each of said cells of said area as a function f (X, Y) of the relevant address values (X, Y), using the computed value for each cell as the threshold value of density for the cell, obtaining a density-related video signal of the portion of the original corresponding to each of said cells by scanning the original, and obtaining screened halftone dot signals by comparing the video signals with the signals of threshold value of density.

4,556,919

TAPE RECORDER MOTOR CIRCUIT

Kenji Fujibayashi, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Mar. 21, 1983, Ser. No. 477,011
Claims priority, application Japan, Mar. 30, 1982, 57-45038[U]
Int. Cl.⁴ G11B *15/48, 15/46*
U.S. Cl. 360—74.1 **6 Claims**

1. A tape recorder motor circuit, comprising:

a power switch connected to a power source;

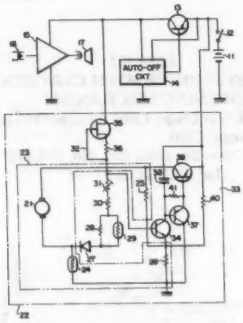
a switching element connected to the power source through the power switch;

automatic shutoff circuit means connected to the power source through the switching element and the power switch and including means for detecting an end of a magnetic tape and means for turning off the switching element in response to detection of the end of the magnetic tape by said detecting means;

an amplifier circuit including power input means connected to the power source through the switching element, and an input terminal;

a magnetic head connected to the input terminal of the amplifier circuit;

a motor servo means including a constant current section connected to the power source through the switching



element to be supplied with power from the power source through the switching element, and an amplifier section connected to the power source through the power switch to be supplied with power substantially directly from the power source, and an output for controlling the motor; and

a motor controlled in response to the output of the motor servo means.

4,556,920

REPRODUCTION DEVICE

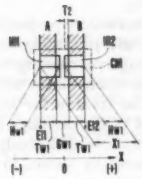
Masaya Maeda, and Masahiro Takei, both of Kanagawa, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

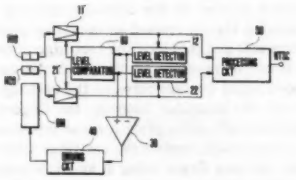
Filed Dec. 8, 1983, Ser. No. 559,223

Claims priority, application Japan, Dec. 10, 1982, 57-216389; Mar. 18, 1983, 58-45664

Int. Cl.[4] G11B *5/56*

U.S. Cl. 360—77 **20 Claims**





1. A reproduction device comprising:

first and second reproduction heads respectively face-contacting two recording tracks on a recording medium; and tracking control means for eliminating a difference in reproduction outputs of the first and second reproduction heads,

the first and second reproduction heads having widths different from widths of recording tracks, and a distance Y between adjacent edges of first and second head gaps in the direction transverse to the tracks being set against a distance GW between adjacent edges of adjoining tracks in the direction transverse to the tracks and a track pitch TP having approximately the following relation:

$$Y=GW+mTP(m=0, 1, 2\ldots),$$

or, a distance X between the other edges of each head gap transverse to the tracks having approximately the relation shown below relative to the track width TW, the distance GW and the track pitch TP:

$$X=2TW+GW+nTP(n=0, 1, 2\ldots).$$

11. A reproduction device comprising:

first and second reproduction heads respectively face-contacting two recording tracks on a recording medium;

first and second amplifiers to amplify reproduction outputs of the first and second reproduction heads;

tracking control means to reduce differences in the outputs of the first and second amplifiers to zero; and

gain adjusting means to adjust gains of the first and second amplifiers to compensate for reproduction characteristics of the first and second reproduction heads.

4,556,921

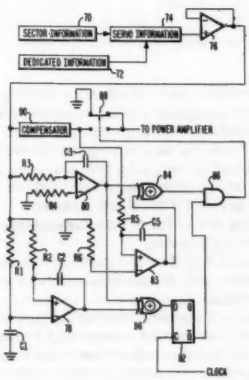
METHOD AND APPARATUS TO IMPROVE THE POSITIONING ACCURACY OF A TRACKING ARM

Andrew M. Rose, Mountain View, Calif., assignor to Memorex Corporation, Santa Clara, Calif.

Filed Jun. 30, 1983, Ser. No. 509,841

Int. Cl.[4] G11B *21/10, 21/08*

U.S. Cl. 360—77 **7 Claims**



1. Apparatus for improving the positioning accuracy of an actuator adapted to be positioned at a selected track on a rotating disk having servo information in sectors of said disc wherein said disc is subject to run-out, said apparatus comprising:

actuator control means for applying actuator current to said actuator in an accelerating or braking direction for positioning said actuator at said selected track;

first detection means for determining the accuracy of positioning of said actuator relative to said selected track and for also determining whether the difference between said actuator and said selected track is increasing or decreasing;

second detection means responsive to said first detection means for determining whether run-out is present and for also determining whether said actuator control means would apply current to said actuator in a braking or accelerating direction in an attempt to position said actuator at said selected track; and

actuator current blocking means responsive to said second detection means for blocking the flow of actuator current to said actuator when run-out is present and said actuator current is in a braking direction.

4,556,922

VCR WITH IMPROVED TAPE THREADING AND GUIDING

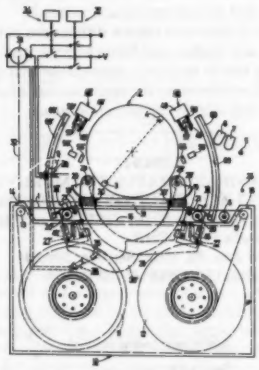
Georg Erhart, Vienna, Austria, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 30, 1982, Ser. No. 403,379

Claims priority, application Austria, Sep. 8, 1981, 3884/81; Mar. 11, 1982, 978/82

Int. Cl.[4] G11B *15/66*

U.S. Cl. 360—85 **21 Claims**



1. A helical scan tape recorder, comprising

at least one tape-guide device, comprising at least one tape guide arranged on a supporting member,

means for moving said tape-guide device between a rest position and an operating position along a predetermined path of movement, comprising a drive member, and a driving device for the drive member,

a positioning device for positioning said tape-guide device in its operating position,

means for keeping the tape-guide device in force-sustained engagement with the positioning device when in the operating position,

disengageable means for coupling the supporting member to said means for moving, comprising facing coupling abutments which act in a direction of movement of the tape-guide device; said disengageable means being arranged such that said tape-guide device and means for moving are in force-sustained engagement with each other during movement of the tape-guide device, and are disengaged from each other in the operating position of the tape-guide device,

characterized in that said disengageable means comprises at least one spring acting between said drive member and said supporting member, and tensioning the drive member and supporting member relative to each other substantially in the direction of movement,

said disengageable means is arranged such that said spring maintains said coupling abutments in force-sustained engagement with each other when a tape-guide device is out of its operating position, and

said spring keepts the tape-guide device in force-sustained engagement with the positioning device when the tape guide device is in its operating position, said drive member being moved with an overtravel relative to the supporting member when said coupling abutments are disengaged.

4,556,923

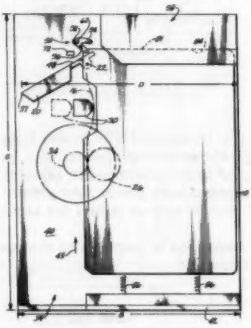
TAPE CARTRIDGE DRIVE WITH CARTRIDGE DOOR OPENING MECHANISM

Dennis R. Olmsted, San Diego, Calif., assignor to Data Electronics, Inc., San Diego, Calif.

Filed Nov. 28, 1983, Ser. No. 555,373

Int. Cl.[4] G11B *23/04*

U.S. Cl. 360—93 **4 Claims**



1. A tape cartridge door opening mechanism for use in a tape drive unit to open a door on the cartridge to expose a portion of the tape for contact with a read/write head, the cartridge door being of the type that includes a closure for the exposed portion of a tape, a pivot about which the closure rotates to expose the tape, and a door opening tab on a side of the pivot axis opposite from the closure and against which a force is applied to rotate the closure to its open position, the door opening mechanism comprising:

a rotatable lever having an outwardly projecting door sensing finger and an outwardly projecting cartridge door opening finger, the two fingers projecting from the body of the lever at different elevations and at different angles;

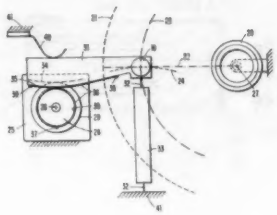
pivot means for mounting the lever in the tape drive unit near the end of the travel of the cartridge into the tape drive unit, the pivot means allowing the body of the lever to rotate about an axis essentially normal to the plane of travel of the cartridge into the tape drive unit; and

means for retaining the lever in an inoperative position in which the cartridge sensing finger is in position for contact with a portion of the cartridge housing as the cartridge housing travels toward an operating position in the tape drive unit and in which the cartridge door opening finger is out of pressure contact with the cartridge door tab upon initial contact between the cartridge sensing finger and the cartridge housing; the fingers being rotatable in unison about the pivot upon an insertion force applied to the cartridge against the cartridge sensing finger, the door opening finger being at an angle relative to the door sensing finger such that the insertion force applied to the cartridge sensing finger causes the door opening finger to rotate and apply pressure to the cartridge door opening tab to pivot the closure portion of the cartridge door toward an open position.

4,556,924
DISK DRIVE HEAD ACCESSING MECHANISM

Frederick F. Quist, Jr., and Marc L. Steinbrecher, both of Boulder, Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 4, 1982, Ser. No. 439,147
Int. Cl.⁴ G11B *5/55*
U.S. Cl. 360—106 **4 Claims**

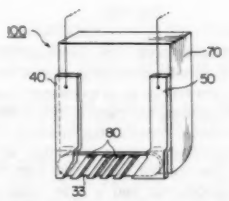


1. A disk drive, comprising:
a planar disk which spins about a fixed-position axis, and carries a multiplicity of concentric data tracks;
a magnetic head which moves generally along one disk radius, as the head is selectively positioned to transduce one of the disk's data tracks, said head movement being along an arc which crosses said one radius at least once;
a head carriage upon which said head is mounted;
a fixed-length, pivoting link having one end pivotally mounted on said disk drive, and the other end pivotally supporting one portion of said head carriage;
a rotatable pulley means drivingly engaging a spaced cam means portion of said head carriage, and operable to cause said head carriage to move generally along said radius and thereby rotate about the point of its attachment to said other end of said pivoted link as said pulley means rotates, to thereby radially move said head to a selected track position, and to concomitantly produce azimuth rotation of said head about an axis parallel to the disk's spin axis, thereby producing generally the same azimuth attitude of said head at each of said data tracks; and
movement means operable to produce concomitant rotation of said pulley means and generally radial movement of said head carriage.

4,556,925
MAGNETORESISTIVE HEAD

Masahide Suenaga; Kousaku Chida, and Masaki Ohura, all of Odawara, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 28, 1982, Ser. No. 402,419
Claims priority, application Japan, Sep. 9, 1981, 56-140974
Int. Cl.⁴ G11B *5/30*
U.S. Cl. 360—113 **20 Claims**

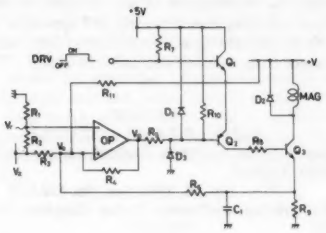


10. A magnetoresistive head for reproducing information recorded on a magnetic recording medium by movement relative to the recording medium comprising:
an elongate magnetoresistive element of a magnetically anisotropic material disposed opposite to said recording medium, said magnetoresistive element including means in the form of a main body portion and means in the form of two end portions respectively disposed along the longitudinal axis of the main body portion, said means in the form of the end portions being configured for suppressing the formation of undesirable domain walls in said magnetoresistive element;
magnetic bias field applying means for applying a magnetic bias field to said magnetoresistive element in a predetermined direction;
a conductive terminals connected to opposite ends of said magnetoresistive element in said longitudinal axis, for electrically connecting said magnetoresistive element through an external circuit; and
a substrate mounting said magnetoresistive element, said conductive terminals and said magnetic bias applying means thereon.

4,556,926
ELECTROMAGNET DRIVING CIRCUIT

Shoji Yanagida, Yokohama, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Sep. 27, 1983, Ser. No. 536,205
Claims priority, application Japan, Sep. 27, 1982, 57-168110; Oct. 30, 1982, 57-189982
Int. Cl.⁴ H01H *47/32*
U.S. Cl. 361—154 **7 Claims**



1. An electromagnet driving circuit comprising:
a voltage source;
an electromagnet having a pair of first and second ends, said first end being electrically connected to said voltage source;
current control means provided as connected between said second end of said electromagnet and a first reference voltage for controlling a driving current passing through said electromagnet, said current control means including a first input terminal which is connected to detect the level of said driving current; and
feed back means connected between said voltage source and said first input terminal for transmitting fluctuating components of said voltage source to said first input of said current control means thereby allowing to compensate for fluctuation components of said voltage source.

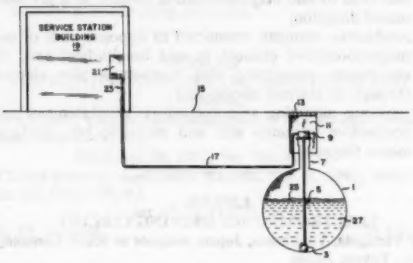
4,556,927
INTRINSICALLY SAFE SIGNAL COUPLER

James O. Steger, Greensboro, N.C., assignor to Gilbarco, Inc., Greensboro, N.C.

Filed Apr. 14, 1983, Ser. No. 484,986
Int. Cl.⁴ H05F *1/00*
U.S. Cl. 361—215 **12 Claims**

1. An intrinsically safe apparatus coupling electrical signals between an electronic controller located in a safe first zone, and a transducer located in a relatively unsafe second zone near the bottom of an underground storage tank containing highly combustible fluid, comprising:
signal coupling means located near the top of said tank for

both bidirectionally passing relatively high frequency (compared) with line frequency) electrical signals with substantially no attenuation, between said electronic controller and said transducer, and for substantially limiting to a safe level the energy content of any electrical signals passed from said first zone into said second zone to prevent ignition of said combustible fluid; and



explosion proof housing means including mechanical barrier means, enclosing said signal coupling means within said mechanical barrier means between said first and second zones, physically isolating said first zone from said second zone, the combination of said housing means and said signal coupling means making said apparatus intrinsically safe, by preventing said combustible fluid and/or vapors thereof from entering said safe first zone.

4,556,928

VEHICLE LAMP ASSEMBLY

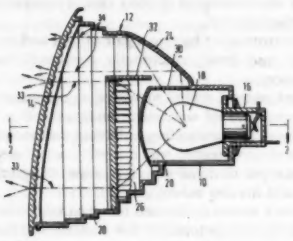
Nicholas W. Tysoe, St. John's, England, assignor to Britax Vega Limited, England

Filed Jun. 14, 1984, Ser. No. 620,443

Claims priority, application United Kingdom, Jul. 5, 1983, 8318224

Int. Cl.⁴ H01G *5/06*

U.S. Cl. 362—268 **7 Claims**



1. A vehicle lamp assembly comprising a housing enclosed by a light transmitting cover element and having an inner portion containing a light source and an outer portion containing a lens arranged to collimate light from the light source parallel to its optical axis, a reflector arranged to collimate light from the light source parallel to the optical axis and to direct the light collimated thereby past an edge of the lens, colour filter means separating the outer portion of the housing from the inner portion, and an opaque baffle extending from the edge of the lens round which light is directed by the reflector to a surface defined by the path of light from the light source to the edge of the reflector nearest to the cover element, the baffle obstructing passage of light between the cover element and the colour filter except via the lens or via the reflector.

4,556,929

MULTI-LAYER CERAMIC CAPACITOR

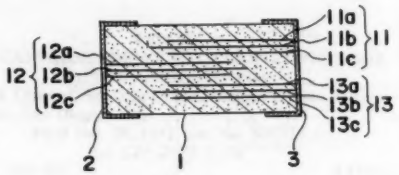
Yukio Tanaka, Tsuruga, and Yoshikazu Chigodo, Fukui, both of Japan, assignors to Murata Manufacturing Co. Ltd., Japan

Filed Jul. 5, 1984, Ser. No. 627,792

Claims priority, application Japan, Jul. 8, 1983, 58-125128

Int. Cl.⁴ H01G *4/42*

U.S. Cl. 361—321 **17 Claims**



1. A multi-layer ceramic capacitor comprising:

a ceramic body having first and second surfaces;

first and second terminal electrodes provided on said first and second surfaces, respectively;

at least one set of electrode extending from said first surface into said ceramic body and electrically connected to said first terminal electrode, said one set of electrode including a plurality of electrode layers extending substantially parallel to each other, said plurality of electrode layers having their edges arranged in tiers; and

at least one set of electrode extending from said second surface into said ceramic body and electrically connected to said second terminal electrode, said one set of electrode including a plurality of electrode layers extending substantially parallel to each other and also to said first mentioned set of electrode, said plurality of electrode layers having their edges arranged in tiers, thereby dispersing the equipotential surfaces appearing around an edge portion of said electrode layers.

4,556,930

LIGHT RADIATION DEVICE AND METHOD FOR TRAPPING FISH

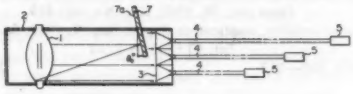
Kei Mori, 3-16-3-501, Kaminoge, Setagaya-ku, Tokyo, Japan

Filed Jul. 15, 1982, Ser. No. 398,634

Claims priority, application Japan, Jul. 18, 1981, 56-112511

Int. Cl.⁴ F21V *7/04*; A01K *75/02*

U.S. Cl. 362—32 **10 Claims**



1. A light radiation device for trapping fish, comprising a light source, a parabolic reflecting mirror for reflecting the light from said light source so as to change it to parallel light, a lens system for focusing the parallel light from said reflecting mirror, and an optical transmitting means for attracting fish, said optical transmitting means including an optical cable, having one end thereof into which the light focused by said lens system is introduced, and a light radiator, said optical transmitting means radiating the light from the other end of said optical cable through said radiator into the sea so as to attract fish, and including a regulating means by which the radiating light is adjusted to be radiated in a desired direction, said regulating means including an adjustable reflecting plate, said plate adjustable between a first position wherein light is

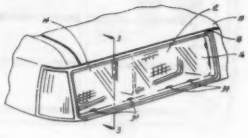
emitted in a horizontal direction and a second position wherein light is emitted in a vertical direction.

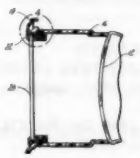
4,556,931

LENS FOR FRONT END PANEL OF AUTOMOTIVE VEHICLE

D. Edward Wheatley, 4451 Ford Rd., Ann Arbor, Mich. 48105

Filed Jan. 30, 1984, Ser. No. 574,890
Int. Cl.⁴ B60Q *1/06*
U.S. Cl. 362—61 **6 Claims**





1. In combination with a vehicle having a front-end panel with an opening, a headlamp recessed with respect to the front end panel and aligned with said opening;

filler housing means disposed in said opening to frame said headlamp, the filler housing means having a wall with first opening framing the headlamp and a second opening disposed adjacent to the front-end panel opening;

a lens having a border generally corresponding to the border of the second opening of the filler housing means, and being removably mounted in said second opening;

a resilient molding mounted about the edge of the lens, said molding comprising an extrusion of a resilient material having a generally T-shaped cross-section including a head extending in opposite directions from a body, the body having an offset portion forming with one side of the head a channel receiving the edge of the lens, the head having a width sufficient to overlap the seam between the lens and the filler housing means, the body of the molding being disposed adjacent the filler housing wall; and

fastening means disposed between the body of the molding and the filler housing wall for releasably connecting the molding to said wall.

4,556,932

LIGHTED NOVELTY ITEM

Bradley D. Lehrer, 32405 First Place S., Federal Way, Wash. 98003, and Daniel A. Rivisto, 8237 - 4th NE., Seattle, Wash. 98115

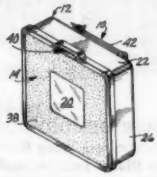
Filed Mar. 28, 1983, Ser. No. 481,146
Int. Cl.⁴ F21L *15/08, 7/00*; F21V *11/00*
U.S. Cl. 362—103 **16 Claims**

8. A battery powered, lighted novelty item, comprising:

a housing, said housing having a front face, said front face having a transparent portion therein, said housing having a rear face connected to said front face by a surrounding side wall, said front and rear faces and said side wall defining a cavity within said housing;

means associated with said housing for gaining access to said cavity;

a lighting unit, said lighting unit being mounted within said housing, said lighting unit including a substantially planar mounting board having a length to width ratio substantially greater than unity, said mounting board being positioned with a longitudinal edge adjacent said rear face of said housing with said mounting board oriented orthogonally relative to said rear face, said mounting board including an electrical circuit attached thereto, said electrical circuit including first and second electrical contacts for abutting the terminals of said battery used to power said lighting unit, said lighting unit including light means attached to said mounting board and connected to said electrical circuit for providing a source of illumination



within said novelty item, said lighting unit also including a lens, said lens having a prism configuration with a first surface attached to said light means, said lens having a second surface that abuts said front face, said lens being positioned adjacent said transparent portion of said front face and sized to allow said transparent portion to superimpose said second surface; and

contact means for providing a continuous electrical circuit between said first and second electrical contacts on said mounting board when said battery is installed in said novelty item, said contact means including a switch means for opening and closing the electrical circuit of said novelty item.

4,556,933

UNDERWATER LIGHT ASSEMBLY WITH ANNULARLY FLARED RE-ENTRANT WALL AND SEALING MEANS

Joe Mendoza, Garden Grove, Calif., assignor to Purex Pool Products, Inc., Lakewood, Calif.

Filed Aug. 27, 1984, Ser. No. 644,507
Int. Cl.⁴ F21V *29/00*
U.S. Cl. 362—267 **8 Claims**

1. In an underwater pool or spa light assembly for retaining an annular lens gasket and light housing in position, the combination comprising

(a) a face ring having a central axis and annular re-entrant wall defining an annular flared wall portion to seat the

gasket assembly, the ring also having means thereon to retain said light housing which is engagable with the gasket to annularly compress same, axially,

(b) and circularly spaced apart tabs on the ring, each tab having substantially constant circular width and projecting generally axially beyond the edge of said annularly flared portion to peripherally position the gasket, the said tabs blocking radially outward extrusion thereof when compressed by said housing, while allowing gasket bulging between the tabs,

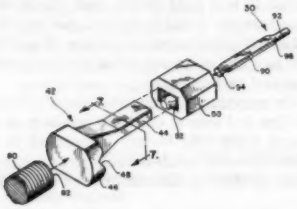
(c) and including said gasket with its periphery positioned radially adjacent said tabs, and the gasket axially compressed between said flared portion and an annular flange defined by said housing, to seal off therebetween, the tabs projecting toward said flange and spaced therefrom, said tabs being carried by said re-entrant wall annular flared portion having a rim, the tabs projecting generally axially from said rim.

4,556,934

SHAPE MEMORY METAL ACTUATOR

Charles D. Lemme, and Tracy R. Lemme, both of Tucson, Ariz., assignors to Blazer International Corp., Franklin Park, Ill.

Filed Feb. 27, 1985, Ser. No. 706,036
Int. Cl.[4] F03G *7/06*
U.S. Cl. 362—279 **14 Claims**



1. In a shape memory metal actuator of the type comprising a shape memory metal actuator element secured to an end fitting, the improvement comprising:

a cold formed portion of the actuator element in alignment with the end fitting and extending away from the end fitting, said cold formed portion being cold formed sufficiently to maintain the cold formed portion in a relatively hard, stiff state and to prevent state changes of the cold formed portion as the actuator element is temperature cycled in normal operation, thereby reducing breakage of the actuator element adjacent to the end fitting.

4,556,935

ADJUSTABLE SHAPE MEMORY METAL ACTUATOR

Charles D. Lemme, Tucson, Ariz., assignor to Blazer International Corp., Franklin Park, Ill.

Filed Feb. 27, 1985, Ser. No. 705,978
Int. Cl.[4] F03G *7/06*
U.S. Cl. 362—279 **10 Claims**

1. A shape memory metal actuator comprising:

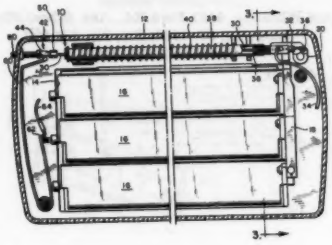
a frame;

a shape memory metal actuator element having first and second ends and defining a direction of motion;

means for connecting the first end of the actuator element to an actuator terminal which is movable with respect to the frame;

an adjustment member which is adjustably positioned with respect to the frame along the direction of motion and defines a stop surface;

an overload protection spring mounted between the frame and the second end of the actuator element and oriented to bias the second end to a rest position determined by the stop surface, said overload protection spring biasing the second end with a selected force which allows the second end to pull away from the stop surface when excessive forces are applied to the actuator terminal, thereby protecting the actuator element from excessive forces;



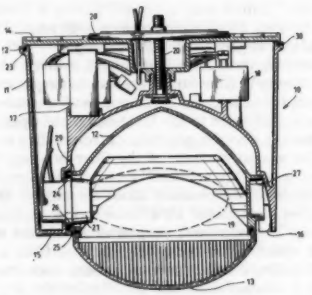
said adjustment member and overload protection spring cooperating to permit adjustment of the rest position of the second end of the actuator element.

4,556,936

ADJUSTABLE LIGHTING LUMINAIRE

Richard F. Snow, Vicksburg, Miss., assignor to Cooper Industries, Inc., Houston, Tex.

Filed Nov. 23, 1984, Ser. No. 674,391
Int. Cl.[4] F21P *1/02*
U.S. Cl. 362—371 **4 Claims**



1. An area lighting luminaire comprising:

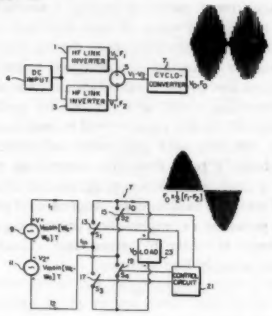
a housing including an integral molded member having spaced apart first and second hollow leg portions and forming a comparment, a removable cover member for closing said compartment, a reflector-lens combination adapted to be supported between said leg portions, said reflector-lens combination including opposed hub portions journalled in means forming opposed recesses formed in said leg portions, respectively, and in such a way that said reflector-lens combination may be rotatably positioned with respect to said housing in a selected working position, one of said recesses being configured to have an open side such that said reflector-lens combination can be mounted on said housing by placing one of said hub portions in the other of said recesses and then radially deforming the other of said hub portions into said one recess, and a lamp socket located at least partially in one of said leg portions and projecting through said one hub portion for holding a lamp within the interior of said reflector-lens combination and to permit rotation of said reflector-lens combination about said hub portions, respectively.

4,556,937

DC-AC POWER CONVERTER INCLUDING TWO HIGH FREQUENCY RESONANT LINK CONVERTERS

Phiovos D. Ziogas, Brossard, Canada, and V. Thathachary T. Ranganathan, Madras, India, assignors to Canadian Patents and Development Limited, Ottawa, Canada

Filed Oct. 5, 1983, Ser. No. 539,178
Int. Cl.⁴ H02M 5/04
U.S. Cl. 363—8 **3 Claims**



1. A DC to low frequency AC power conversion system, comprising:

a first high frequency link inverter operating at a first high frequency;

a second high frequency link inverter operating at a second high frequency;

DC input means;

subtractor means having two input terminals and an output terminal; and

cycloconverter means;

said first and second inverters being connected in parallel to said DC input means at the input ends thereof, and to the input terminals of said subtractor means at the ouput ends thereof;

the output terminal of said subtractor means being connected to said cycloconverter;

the difference in magnitude between said first high frequency and said second high frequency being equal to twice said low frequency.

4,556,938

MICROCODE CONTROL MECHANISM UTILIZING PROGRAMMABLE MICROCODE REPEAT COUNTER

Tony E. Parker, and Gerard A. Veneski, both of Boca Raton, Fla., assignors to International Business Machines Corp., Purchase, N.Y.

Filed Feb. 22, 1982, Ser. No. 350,682
Int. Cl.⁴ G06F 9/22
U.S. Cl. 364—200 **13 Claims**

1. In a microprogrammed data processor wherein a sequence of microwords are used to control execution of each processor instruction, an improved microcode control mechanism comprising:

instruction circuitry for providing a plural-bit instruction dependent signal indicating the processor instruction to be executed;

sequence counter circuitry for supplying a sequence of plural-bit number signals;

a programmable logic array mechanism jointly responsive to the instruction dependent signal and to the sequence of number signals for producing a sequence of microwords needed to execute the instruction;

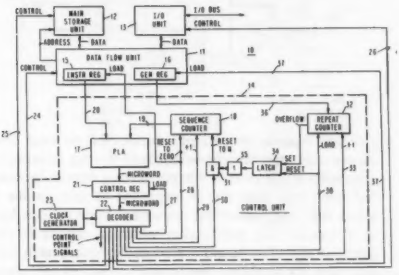
repeat circuitry responsive to a predetermined microword for setting the sequence counter circuitry to a count which is less than a current count for causing a selected portion of the microword sequence to be repeated;

repeat control circuitry including a repeat counter for counting the number of times the selected portion of the microword sequence is repeated and for disabling the repeat circuitry after a predetermined number of such repeats;

and circuitry for loading into the repeat control circuitry a number value which determines the number of repeats that will be allowed for the selected portion of the microword sequence, said number value being variable with each occurrence of an instruction;

control circuitry responsive to the microwords from the programmable logic array for producing for each microword a plurality of control point signals for controlling operation of the data processor for one microword cycle;

the circuitry for loading the repeat control circuitry includes circuitry responsive to a predetermined control point signal produced by a predetermined microword occurring



before occurrence of the selected portion of the microword sequence for loading the repeat counter with an initial count value;

the repeat circuitry includes circuitry responsive to a predetermined control point signal produced by a predetermined microword in the selected portion of the microword sequence for supplying a repeat signal to the sequence counter circuitry to a count which initiates the repeating of the selected portion of the microword sequence;

repeat control circuitry includes circuitry responsive to a predetermined control point signal produced by a predetermined microword in the selected portion of the microword sequence for changing by a fixed amount the number value in the counter;

and the repeat control circuitry includes output circuitry responsive to a predetermined number value in the repeat counter for disabling the supplying of the repeat signal to the sequence counter circuitry.

4,556,939

APPARATUS FOR PROVIDING CONFLICT-FREE HIGHWAY ACCESS

Edgar L. Read, Carrollton, Tex., assignor to Honeywell Inc., Minneapolis, Minn.

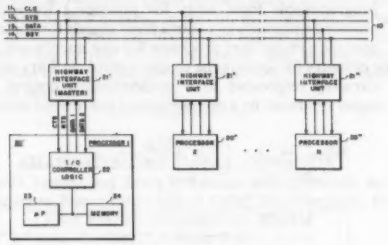
Filed Apr. 29, 1983, Ser. No. 490,007
Int. Cl.⁴ G06F 3/04
U.S. Cl. 364—200 **5 Claims**

1. In a communication system, which includes a plurality of communication devices, each communication device being operatively connected to a common highway via a corresponding interface apparatus, wherein said highway includes a clock line, a data line, and a busy line, each interface apparatus comprising:

(a) counter means, having a first input terminal operatively connected to said clock line, for counting a clock signal transmitted on said clock line to generate a clock value,

and having a second input terminal operatively connected to said busy line to disable said counting when a busy signal is present on said busy line;

(b) compare means, operatively connected to said counter means, for comparing said clock value to a device number value, associated with the corresponding communication device, each communication device having a unique device number value, to output an enable signal when said clock value and said device number value are equal, thereby permitting only one communication device to transmit onto the highway; and



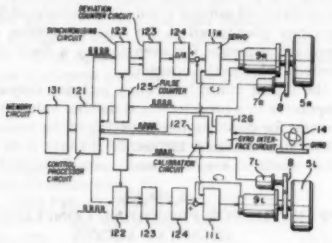
(c) driver means, operatively connected to said compare means and operatively connected to the corresponding communication device, for permitting data to be transmitted onto said data line in response to said enable signal when said corresponding communication device has data to be transmitted, and further including means for causing the busy signal to be generated and coupled onto the busy line, thereby disabling the counter means of each interface apparatus.

4,556,940

ROBOT VEHICLE

Hisashi Katoo; Kunio Fujiwara, and Yoshikazu Kawashima, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 3, 1981, Ser. No. 299,230
Claims priority, application Japan, Sep. 5, 1980, 55-124462
Int. Cl.[4] G06F *15/50*
U.S. Cl. 364—424 **1 Claim**



1. A robot vehicle for automatic operation in a predetermined travelling route which comprises:

a pair of driving wheels connected to a driving device;

means for detecting the revolving speed of each of said driving wheels and providing a travelling distance of said vehicle;

a gyro for detecting azimuth of the travelling direction of said robot vehicle;

a first memory means for memorizing a travelling program including data of a programmed travelling distance and a programmed azimuth;

a control processor device which controls the travelling of said robot vehicle depending upon the travelling program of said first memory means by comparing the travelling distance and azimuth of said travelling program with a travelling distance detected by said revolving speed detector means and an azimuth detected by said gyro wherein said control processor device outputs a control signal;

means for controlling the turning of said vehicle in response to said control signal by individually controlling the speed of each of said driving wheels; and

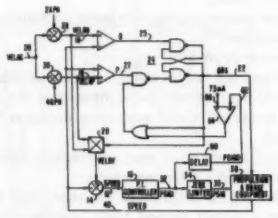
calibration adjustment means including a second memory means for storing the value of said detected azimuth of said gyro at predetermined locations during said travelling route, means for adjusting said detected azimuth of said gyro to zero at said predetermined locations in said predetermined travelling route, and a means for updating said detected azimuth by the value stored in said second memory means, wherein said calibration adjustment means further includes a path deviation correcting means for correcting a deviation from a programmed straight line segment of travel of said vehicle, wherein said path deviation means provides a compensation control signal to said vehicle wheels in order to return said vehicle to said programmed straight line segment.

4,556,941

TRANSIT VEHICLE SPEED MAINTAINING CONTROL APPARATUS AND METHOD

Pierre A. M. Zuber, Baldwin, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 11, 1983, Ser. No. 483,795
Int. Cl.[4] B61L *3/18*
U.S. Cl. 364—426 **10 Claims**



1. In apparatus for controlling the velocity of a passenger vehicle moving along a track having a desired command speed, the combination of:

means responsive to the command speed for providing a brake reference velocity,

means responsive to the command speed for providing a power reference velocity,

means responsive to the vehicle movement for providing an actual velocity feedback,

means responsive to the brake reference velocity, the power reference velocity and the actual velocity feedback to provide an output control signal to determine one of a power mode and a brake mode,

means responsive to said output control signal for providing a velocity reference in accordance with one of the brake reference velocity and the power reference velocity,

means responsive to the velocity reference and the actual velocity feedback for providing a velocity error signal,

means providing an effort control signal having a magnitude for determining the vehicle effort in relation to moving along the track, and

control means responsive to the effort control signal and operative with the output control signal providing means for determining the provision of said output control signal in response to the effort control signal.

4,556,942

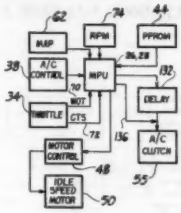
MICROPROCESSOR BASED ENGINE CONTROL SYSTEM FOR CONTROLLING HEAVY ENGINE LOADS

Frank A. Russo; Michael A. Pauwels, both of Williamsburg, and Thomas A. Bauer, Newport News, all of Va., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed May 27, 1983, Ser. No. 499,113

Int. Cl.[4] B60H *3/04;* **F02M** *23/06;* **F02D** *35/00*

U.S. Cl. 364—431.07 **4 Claims**



4. In a microprocessor based engine control system, a system for controlling heavy engine loads such as an air conditioner compressor during rapid intake manifold pressure changes, said system comprising:

a manifold pressure sensor responding to the pressure in the manifold and generating an electrical signal in response to said pressure;

means for calculating the rate of change of response of said electrical signal;

means for comparing said rate of change of said electric signal with first and second predetermined values and generating a first control signal when said rate of change exceeds said first predetermined value and a second control signal when said second predetermined value exceeds said rate of change;

a timer responsive to said first control signal for setting said timer to a known value and responsive to said second control signal for decrementing said timer to a second known value; and

clutch means for disconnecting and connecting the heavy engine load, said clutch means responsive to said first control signal for disconnecting the heavy engine load and responsive to said timer equal to said second known value for connecting the heavy engine load.

4,556,943

MULTIPROCESSING MICROPROCESSOR BASED ENGINE CONTROL SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

Michael A. Pauwels, Williamsburg; Danny O. Wright, Grafton, both of Va., and Bruce J. Harvey, Sterling Heights, Mich., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed May 27, 1983, Ser. No. 499,110

Int. Cl.[4] F02B *3/00;* **G05B** *15/02;* **G06F** *15/16*

U.S. Cl. 364—431.12 **8 Claims**

1. A multiprocessing microprocessor based fuel injection system for an internal combustion engine comprising:

power supply receiving means adapted to receive power upon demand of the engine operator and to receive standby voltage during engine non-operating times;

a plurality of sensors adapted to be mounted on the engine, each of said sensors providing an output electrical signal representing one of a plurality of engine operating conditions;

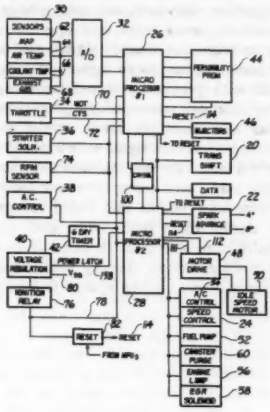
A/D converter means for converting said output signals from said sensors into digitally equivalent signals;

injector means mounted on the engine upstream of the intake valves of the engine;

fuel supply means including a fuel pump adapted to supply fuel to said injector means;

programmable read only memory (PROM) means for storing control law constants and data signals representative of predetermined engine calibrations unique to the engine, and

a first and second microprocessor having storage means therein, said first microprocessor having a master control program stored in its storage means and receiving input



signals from said programmable read only memory means and both of said microprocessors electrically connected together in a multiprocessing configuration for shared computational operation according to input signals provided by said sensors, said programmable read only memory means and predetermined data in said storage means for calculating fuel quantity electrical signals to operate said injector means from said first microprocessor and said fuel pump from said second microprocessor.

4,556,944

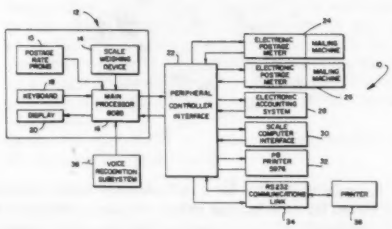
VOICE RESPONSIVE AUTOMATED MAILING SYSTEM

Edward P. Daniels, Bridgeport, and Daniel F. Dlugos, Huntington, both of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Feb. 9, 1983, Ser. No. 465,132

Int. Cl.[4] G06F *15/20;* **G10L** *1/00*

U.S. Cl. 364—466 **3 Claims**



1. An automated parcel mailing system comprising:

(a) A postage value determining scale, said scale including a processor, means for providing parcel weight information, memory means for storing postage value rate information, means for introducing postage value related information, and display means for visually indicating postage informa-

tion, said processor receiving the parcel weight information and said postage value related information and in response thereto retrieving appropriate postage rate information from the memory means and generating a postage value for a parcel;

(b) said means for introducing postage value related information further comprising a voice recognition subsystem including a voice recognition unit and microphone means for communications between an operator and said voice recognition subsystem, said microphone means receiving an audible word from said operator and in response thereto providing a word signal, said voice recognition unit receiving said word signal and comparing said word signal with previously stored word signals, said voice recognition unit transmitting a predetermined signal associated with each previously stored word signal upon matching a received signal with a stored word signal; and,

(c) control means for said operator to selectively enable and disable said voice recognition subsystem, whereby said operator may enable said voice recognition subsystem only during those times when said operator wishes to verbally introduce postage value related information to said mailing system, thereby substantially reducing the chance that said mailing system will respond to spurious noise.

4,556,945

MULTI-HARNESS LOOM CONTROL

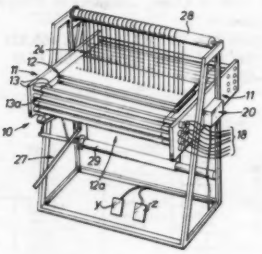
Richard B. Fry, 10 Avenue Secheron, 1202 Geneva, Switzerland

Filed Jun. 1, 1983, Ser. No. 500,144

Claims priority, application United Kingdom, Jun. 3, 1982, 8216158

Int. Cl.⁴ G06F *9/06*; D03D *29/00*

U.S. Cl. 364—470 **9 Claims**



1. A weaving control for a multi-harness loom comprising drive means for each harness and electronic control means for operating the drive means to move each harness for creation of a shed pattern from warp yarns, wherein the warp yarns of the loom are divided into a number of groups of yarns equal to the number of harnesses, each harness controls one yarn from each group and means for manually selecting a pattern from a series of predefined shed patterns as the weaving process progresses, said electronic control means being responsive to said manual selection means for controlling said drive means to implement the selected pattern.

4,556,946

GROUND DETECTION ARRANGEMENT FOR A.C. GENERATOR

Ryosuki Taniguti, Nagasaki, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

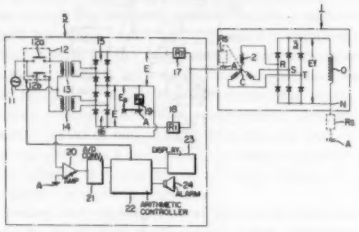
Filed Jul. 29, 1982, Ser. No. 402,972

Claims priority, application Japan, Aug. 7, 1981, 56-124881

The portion of the term of this patent subsequent to Sep. 17, 2002, has been disclaimed.

Int. Cl.⁴ G06G *7/62*; G08B *21/00*

U.S. Cl. 364—481 **9 Claims**



1. A ground detection arrangement for an A.C. generator comprising:

resistors (R_1) of high resistance connected to a neutral point of an armature winding of the A.C. generator,

a voltage source of positive and negative D.C. voltages (+E) and (−E) alternately applied to the neutral point of said armature winding through said resistors (R_1),

a detecting resistor (R_D) connected between the D.C. voltage source and the ground of the circuit arrangement, and

an arithmetic controller connected to receive voltages (E_{D+}) and (E_{D-}) developed across said detecting resistor (R_D) when the respective positive and negative D.C. voltages (+E) and (−E) are applied, including means for calculating a ground resistance (R_S) for a ground position on the basis of a sum of absolute values of both detected voltages (E_{D+}) and (E_{D-}), and said D.C. voltages (+E) and (−E) and said resistors (R_1) and (R_D) and for comparing the calculated result for ground resistance (R_S) with a reference resistance value.

4,556,947

BI-DIRECTIONAL SWITCHING CIRCUIT

Jerry E. Prioste, Scottsdale, and David E. Lopez, Tempe, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 23, 1982, Ser. No. 410,294

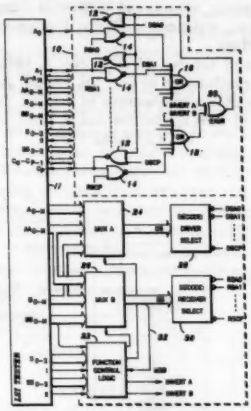
Int. Cl.⁴ G06F *15/20*

U.S. Cl. 364—550 **10 Claims**

7. A bidirectional switching circuit with selectable inversion for providing a matrix of AC data path time values as measured by a tester, wherein values from subsequently tested circuits may be compared, thereby providing a standardized set of values for each circuit tested, said circuit having a plurality of pins, including input/output pins, select pins, and at least one inverting pin, comprising:

a first logic means coupled to said plurality of pins for pro-

viding a bi-directional path with selectable inversion between any of said plurality of pins; and



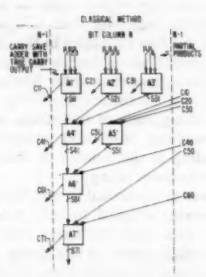
a second logic means coupled to said plurality of pins and said first logic means for selecting a path according to the signals applied to said select pins and said inverting pins.

4,556,948

MULTIPLIER SPEED IMPROVEMENT BY SKIPPING CARRY SAVE ADDERS

Brian R. Mercy, Warrenton, Va., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 15, 1982, Ser. No. 449,924
Int. Cl.[4] G06F 7/52
U.S. Cl. 364—757 **5 Claims**



1. In a multiplier including a partial product adder having a plurality of binary bit columns for adding M partial products, an N^{th} one of said bit columns having an N^{th} bit significance, comprising:

a first carry save adder in a first stage, having three single bit inputs for receiving corresponding bits from a first, a second and a third respective ones of said partial products, a first sum bit output and a first complemented carry bit output, for outputting said first complemented carry bit after a delay interval and for outputting said first sum bit after two of said delay intervals with respect to the instant of receipt of said partial products;

a second carry save adder in said first stage, having three single bit inputs for receiving corresponding bits from a fourth, a fifth and a sixth respective ones of said partial products, a second sum bit output and a second complemented carry bit output, for outputting said second complemented carry bit after said delay interval and for outputting said second sum bit after two of said delay intervals with respect to said instant of receipt of said partial products;

a third carry save adder in said first stage, having three single bit inputs for receiving corresponding bits from at least a seventh and an eighth respective ones of said partial products, a third sum bit output and a third complemented carry bit output, for outputting said third complemented carry bit after said delay interval and for outputting said third sum bit after two of said delay intervals with respect to said instant of receipt of said partial products;

a fourth carry save adder in a second stage following said first stage in said N^{th} bit column, having three single bit inputs for receiving said first, second and third sum bits respectively, a fourth sum bit output and a fourth complemented carry bit output, for outputting said fourth complemented carry bit after three of said delay intervals and for outputting said fourth sum bit after four of said delay intervals with respect to said instant of receipt of said partial products;

a fifth carry save adder in said second stage, having three single bit inputs for receiving complemented carry bits from a first stage of an adjacent one of said plurality of binary bit columns having an N−1st bit significance, the received complemented carry bits corresponding to said first, second and third complemented carry bits respectively, said fifth carry save adder having a fifth complemented sum bit output and a fifth carry bit output, for outputting said fifth carry bit after two of said delay intervals and for outputting said fifth complemented sum bit after three of said delay intervals with respect to said instant of receipt of said partial products;

a sixth carry save adder in a third stage following said second stage in said N^{th} bit column, having three single bit inputs for respectively receiving said fifth complemented sum bit and a true and a complemented carry bit from a second stage of said adjacent one of said plurality of binary bit columns having said N−1st bit significance, the two received carry bits corresponding to said fourth complemented and fifth true carry bits respectively, said sixth carry save adder having a sixth sum bit output and a carry bit output, for outputting a carry bit after four of said delay intervals and for outputting said sixth sum bit after five of said delay intervals with respect to said instant of receipt of said partial products;

a seventh carry save adder in a later stage following said third stage in said N^{th} bit column, having three single bit inputs, with a first input thereof connected to said fourth sum bit output of said fourth carry save adder, skipping said third stage in said N^{th} bit column, said second input of said seventh adder connected to said sixth sum bit output from said sixth carry save adder in said N^{th} bit column, said third input of said seventh adder receiving a carry bit from a stage following said second stage of said adjacent N−1st one of said bit columns, said seventh carry save adder having a seventh sum bit output and a seventh complemented carry bit output, for outputting said seventh complemented carry bit and seventh sum bit, the sum of which is the final product bit for said N^{th} bit column of said multiplier;

whereby said skipping of said third stage increases the speed of operation of the multiplier.

4,556,949

THREE WAVE SURFACE ACOUSTIC WAVE (SAW) SIGNAL PROCESSOR

Leland P. Solie, Acton, Mass., assignor to Sperry Corporation, New York, N.Y.

Filed Apr. 4, 1983, Ser. No. 481,710
Int. Cl.[4] G06G 7/19; H03H 9/26
U.S. Cl. 364—821 **6 Claims**

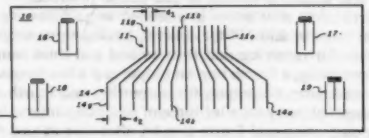
1. A surface wave apparatus comprising:

means having a surface layer for propagating acoustic

waves, said surface layer having an interaction region possessing nonlinear properties such that two acoustic signals coalescing in said interaction region form a product signal representative of a multiplication of said two signals;

a first array of conductive elements having first and second acoustic ports, said conductive elements positioned in said interaction region with spacing d_1 therebetween;

a second array of conductive elements having third and



fourth acoustic ports located such that said first and third ports and said second and fourth ports respectively form port pairs at opposite ends of said first and second arrays, said conductive elements of said second array correspondingly coupled to said conductive elements of said first array and positioned in said interaction region with spacing d_2 between said conductive elements of said second array, where $d_2 = Ad_1$, A being a predetermined constant, said spacing d_2 selected for propagating said product signal along a selected array.

4,556,950

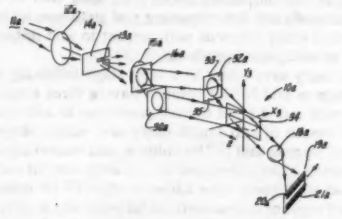
INCOHERENT OPTICAL PROCESSOR

Anthony M. Tai, Plymouth, and Carl C. Aleksoff, Ann Arbor, both of Mich., assignors to Environmental Research Institute of Michigan, Ann Arbor, Mich.

Filed Sep. 2, 1983, Ser. No. 528,942

Int. Cl.[4] G06G *9/00*; G02B *5/18*

U.S. Cl. 364—827 **7 Claims**



3. An optical signal processor for performing real time Fourier transformations on the intensity distribution of an incoherent input line light source, said processor comprising:

lens means for collimating light radiated from the line source;

first grating means downstream from the lens and having a given spatial frequency, operative to split the light into two symmetric parts;

recombination grating means downstream from the first grating means including second and third gratings having twice the spatial frequencies as the first grating means, operative to recombine the light and cause the two parts to interfere at an interference zone;

beam splitting means in the interference zone, operative to deflect light incident thereon; and

imaging lens means for mapping the light from the beam splitter means to an output plane where the Fourier transformation of the input light source can be read.

4,556,951

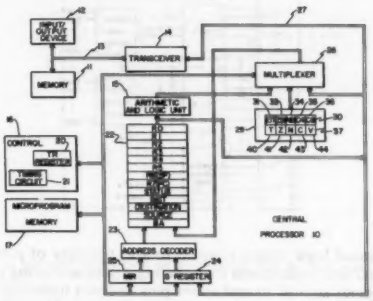
CENTRAL PROCESSOR WITH INSTRUCTIONS FOR PROCESSING SEQUENCES OF CHARACTERS

Lloyd I. Dickman, Sudbury, and William D. Strecker, Harvard, both of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Continuation of Ser. No. 386,827, Jun. 6, 1982, abandoned, which is a continuation of Ser. No. 59,038, Jul. 19, 1979, abandoned, which is a continuation of Ser. No. 848,201, Nov. 3, 1977, abandoned. This application Jan. 5, 1984, Ser. No. 540,510

Int. Cl.[4] G06F *7/34*

U.S. Cl. 364—900 **4 Claims**



1. A processor for use in a data processing system including a memory for storing instructions, and data, said processor including processing means for processing data in response to the instructions and processor status means connected to the processing means for storing a condition code that reflects conditions in the processing means upon completion of each instruction, said processor further including:

a. first and second address storage means coupled to said processing means each for storing an address of a character in a character string, each of said address storage means initially receiving from said processing means an address of the first character in the character string;

b. first and second string length storage means coupled to said processing means each for storing values identifying the number of characters remaining in a corresponding character string, each of said string length storage means initially receiving from said processing means a value corresponding to the number of characters in the corresponding character string;

c. retrieval means connected to said first and second address storage means, coupled to said processing means and responsive to a character string instruction for enabling said processing means to iteratively retrieve characters from both character strings from said memory at locations identified by the addresses stored in said first and second address storage means during each of a succession of retrieval operations,

d. comparison means connected to said retrieval means and coupled to said processing means for enabling said processing means to compare, after each retrieval operation, the characters from each character string as retrieved by said retrieval means;

e. altering means comprising means coupled to said processing means and connected to both said address storage means and both said string length storage means for (i) altering both said address storage means to point to the next characters in both said character strings and further altering said string length storage means of at least the storage means storing the length of the shorter string if said processing means determines that the character match, and (2) resetting the contents of said first address storage means to be initial address and said first string latch storage means to the initial value and altering the

contents of said second address storage means and said second string length storage means if said processing means determines that the retrieved characters do not match, the amount by which the second address storage means and said second string length storage means are altered being determined by the number of prior matches of characters in the character strings; and

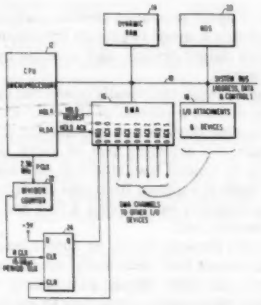
f. testing means coupled to said processor means and said comparison means for establishing the condition code in said processor status means in response to successful and unsuccessful comparisons by said comparison means; whereby the Processor can make use of the condition code in processing of instructions subsequent to the character string instruction to determine the existence of the predetermined characteristic in the character string, and the contents of both said address storage means and both said string length storage means identify the locations of the matching strings in the memory.

4,556,952

REFRESH CIRCUIT FOR DYNAMIC MEMORY OF A DATA PROCESSOR EMPLOYING A DIRECT MEMORY ACCESS CONTROLLER

James A. Brewer, Delray Beach, Fla.; Lewis C. Eggebrecht, Rochester, Minn.; David A. Kummer, and Patricia P. McHugh, both of Boca Raton, Fla., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 12, 1981, Ser. No. 292,075
Int. Cl.[4] G06F *13/00*
U.S. Cl. 364—900 2 Claims



1. In a data processing system having a common system bus for transferring address, data and control information among a central processing unit which produces a system clock signal, a programmable direct memory access controller which has a plurality of prioritized channels; a plurality of input/output devices connected to said common system bus; and a dynamic memory coupled to said common system bus which requires periodic refreshing within predetermined minimum time intervals;

the improvement comprising apparatus for refreshing said memory, comprising:

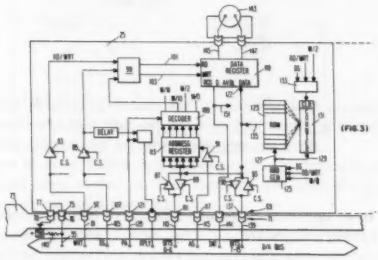
memory refresh request signal generating means, coupled between the central processing unit and the highest priority channel of the direct memory access controller, and responsive to the system clock signal for periodically applying memory access request signals to said highest priority channel to initiate memory refresh cycles in said memory by said direct memory access controller via said common system bus within said predetermined minimum time intervals.

4,556,953

INTERCHANGEABLE INTERFACE CIRCUITRY ARRANGEMENTS FOR USE WITH A DATA PROCESSING SYSTEM

A. Ronald Caprio, 21 Francis Wyman Rd., Burlington, Mass. 01803; John P. Cyr, 146 Hartwell Ave., Littleton, Mass. 01460; Bernard O. Geaghan, 203 Edgebrook Dr., Boylston, Mass. 01505; Paul C. Kotschenreuther, 71 Derby Rd., Berlin, Mass. 01503; David J. Schanin, 5 July Rd., Sudbury, Mass. 01776, and Ronald M. Salett, 42 Oakvale Rd., Framingham, Mass. 01701

Filed Feb. 24, 1982, Ser. No. 351,718
Int. Cl.[4] G06F *3/00, 3/04*
U.S. Cl. 364—900 8 Claims

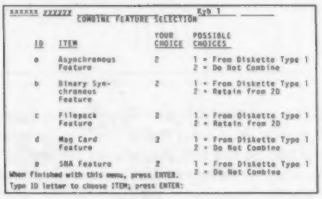


1. In association with a data processing system, which includes central processor circuitry means, memory circuitry means holding at least address signals, control logic circuitry means and bus circuitry interconnecting the three last mentioned circuitry means, means for enabling said data processing system to interchangeably utilize any one of a plurality of data signal responsive means, said means for enabling comprising in combination: a plurality of circuit mounting means, each having at least one interface circuit mounted thereon; a plurality of holding means with each having first engageable electrical terminals with said each first engageable terminal having an engageable end and a non-engageable end with said non-engageable end connected to said bus circuitry and with at least one of said terminals being designated an address terminal; first circuitry coupled through said bus circuitry to said memory circuitry means and formed to receive and decode sets of address signals from said memory circuitry means and wherein each set of address signals designates a different one of said address terminals; second circuitry means connected to respectively transmit decoded address signals from said first circuitry through said bus circuitry to associated ones of said address terminals whereby each of said address terminals will be respectively activated in response to its address signals being decoded; a plurality of interface circuitry means with each having second engaging electrical terminals and each of said interface circuitry means located on a different one of said circuit mounting means and each further in engaging relationship with said first engageable terminals of an associated holding means to be thereby connected to said bus circuitry and each interface circuitry means connected to an associated one of said data signal responsive means, and each interface circuitry means further providing identifying signals; instruction circuitry means coupled through said bus circuitry means to said memory circuitry means to provide signals to cause said memory circuitry means to store at an address, determined in part by a set of said identifying signals, a set of said address signals which when decoded represent the address terminal of said holding means whereat the one of said interface circuitry means providing said identifying signals is located.

4,556,954
METHOD FOR DISPLAYING SELECTED TEXT PROCESSING TASK OPTIONS CORRESPONDING TO THE CONTENTS OF THE COMBINED PROGRAM DISKETTE

Hira Advani, and Gerald E. Hayes, both of Austin, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 311,088, Oct. 13, 1981, abandoned. This application Sep. 20, 1984, Ser. No. 652,440
Int. Cl.⁴ G06F *1/00*
U.S. Cl. 364—900 **4 Claims**

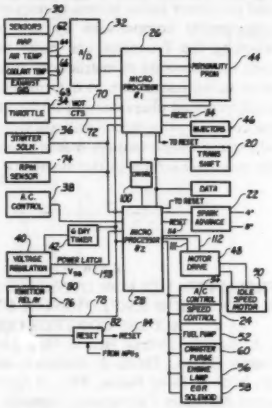

COMBINE FEATURE SELECTION Sys 1
ID ITEM YOUR CHOICE POSSIBLE CHOICES
a Asynchronous Feature 2 1 = From Diskette Type 1 2 = Do Not Combine
b Binary Synchronous Feature 2 1 = From Diskette Type 1 2 = Retain from 2D
c Filepack Feature 2 1 = From Diskette Type 1 2 = Retain from 2D
d Mag Card Feature 2 1 = From Diskette Type 1 2 = Do Not Combine
e SNA Feature 2 1 = From Diskette Type 1 2 = Do Not Combine
When finished with this menu, press ENTER.
Type ID letter to choose ITEM; press ENTER:

1. In an operator controlled interactive text processing system having a keyboard, a display device, and a diskette drive for entering programs into said system, said system performing text processing tasks that are selected by said operator interactively from menus which are displayed by said system to said operator from portions of programs entered into said system from a "combined-program" diskette, said "combined-program" diskette having a set of selected text processing task programs that were previously transferred from a plurality of different program source diskettes, said selected set comprising some but not all of said text processing task programs initially stored on said different program source diskettes so that some menus associated with said programs on said different program source diskettes are no longer valid to guide said operator through a series of text processing task programs corresponding to said set of transferred programs, said "combined-program" diskette further including a table of data that is captured during the creation of said "combined-program" diskette which indicates to said system each said transferred text processing task program in said selected set, an improved method of assisting said operator in the interactive selection of text processing tasks when said "combined-program" diskette is employed to control said system, said method comprising the steps of (1) displaying to said operator a first stored menu which includes a plurality of options each of which is defined by (a) an ID character and (b) a literal text description of the option and which corresponds substantially to a menu which was stored on at least one of said plurality of different program source diskettes and (2) developing the information format and content for a second menu dynamically with said system prior to display, (a) in response to keying into said system from said keyboard one of said ID characters when said first menu is displayed to select one option from said menu displayed in step (1) to cause said system to display said second menu, said second menu including a plurality of options, each of which is also defined by (i) an ID character and (ii) a literal text description of the option, and (b) in accordance with said data stored in said table during the creation of said "combined-program" diskette so that said second menu is unique to the specific and "combined-program" diskette and displays only valid options to subsequent text processing tasks corresponding to said selected set of transferred programs and invalid options corresponding to text processing task programs that were not transferred to said "combined-program" diskette during its creation are not displayed on said second menu.

4,556,955
SINGLE CRYSTAL DUAL MICROPROCESSOR COMPUTING SYSTEM

Danny O. Wright, Grafton, and Robert E. Weber, Newport News, both of Va., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed May 27, 1983, Ser. No. 499,114
Int. Cl.⁴ G05B *15/02*; G06F *1/00, 15/48*
U.S. Cl. 364—133 **1 Claim**



1. A single crystal dual microprocessor computing system comprising:

a plurality of signal generating devices, each device generating an electrical signal having an informational value;

a plurality of output devices each actuable by one or more control signals;

dual microprocessors electrically connected in parallel, each receiving at least a portion of the electrical signals from said generating devices and operable for calculating control signals for actuating one or more output devices according to control laws stored in said microprocessors and information supplied from said electrical signals;

said microprocessors each having a first and second clock input terminals; and

a single crystal element having an output lead and a return lead, said output lead electrically connected to said first clock input terminals of said dual microprocessors, said return lead electrically connected to said second clock input terminal of said first of said dual microprocessors, and said second clock input of said second of said dual microprocessors connected to electrical ground, whereby said first microprocessor operates as a master microprocessor for synchronizing said second microprocessor to said first microprocessor.

4,556,956
ADJUSTABLE GAIN CONTROLLER FOR VALVE POSITION CONTROL LOOP AND METHOD FOR REDUCING JITTER

Royston J. Dickenson, Scotia, and Vijay C. Jaswa, Clifton Park, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Sep. 16, 1983, Ser. No. 533,644
Int. Cl.⁴ G05B *13/04*
U.S. Cl. 364—162 **8 Claims**

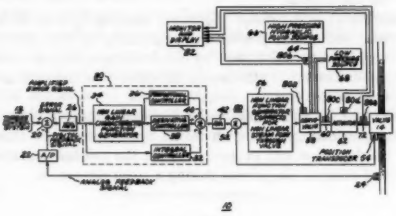
1. In combination with a steam turbine, wherein steam flow through a valve is controlled by a valve position control loop, the regulation of said valve being set relatively low thereby establishing a relatively high overall gain for said control loop, said control loop responding quickly to error signals and in-

cluding an electrohydraulic valve actuator which directly effects the positioning of said valve, an adjustable gain controller as part of the digitized portion of said control loop which receives said error signals amplified by the reciprocal of the valve's regulation value, wherein the adjustable gain controller comprises:

an integral controller receiving the amplified error signals and integrating said amplified error signals over a preselected time period;

an electronic operator which includes means for initially selecting a value of A between −1.0 and +1.0 and means for initially selecting a value of n from the group consisting of 0, 1 and 2, said electronic operator generating a gain factor G, which is limited to positive values from the relationship expressed by

$$G=A+(1-A)(E/REG)^n$$



wherein E is the normalized value of said error signal and the value of REG is the valve's regulation value, and said electronic operator multiplying said amplified error signals by said gain factor;

a proportional controller in parallel with a derivative controller, both receiving the electronic operator's output signal;

means for summing the outputs of said integral controller, said derivative controller and said proportional controller together; and

means for adjusting both said value of A and said value of n to reduce the mechanical and hydraulic jitter in said electrohydraulic valve actuator which is caused by said digitized portion of said valve position control loop and yet maintain the relatively quick response of said control loop to said error signals.

4,556,957

SYSTEM FOR DEFINING GRAPHIC PATTERNS FOR A NUMERICAL CONTROL APPARATUS

Toru Ichikawa, Aichi, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 30, 1983, Ser. No. 527,719

Claims priority, application Japan, Aug. 31, 1982, 57-151475; Sep. 6, 1982, 57-155003

Int. Cl.⁴ G06F *15/46*

U.S. Cl. 364—171 **17 Claims**

1. A system for defining graphic patterns for an NC apparatus, comprising:

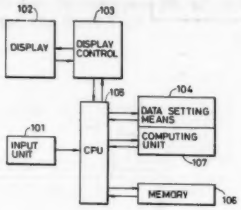
display means;

display control means for controlling said display means to display addresses identifying data for defining a graphic pattern;

data setting means for setting known data corresponding to the addresses displayed on said display means and indicative of the desired graphic pattern, said display control means, when known data corresponding to less than all of said displayed addresses are set, continuing to display the addresses of unknown data not set by said data setting means, with the display adjacent each unknown data address indicating, e.g., by means of a blank display area, that said each address corresponds to unknown data;

a memory for storing said addresses, the data set by said data setting means, and mathematical formulas;

computing means for operating on said set data stored in said memory according to said formulas to determine the values of unknown data which have not been given numerical values by said data setting means;



central processing means for controlling said computing means and said memory to store the results of computations effected by said computing means; and

output control means responsive to the set data and computed data stored in said memory for controlling the movements of a machine tool.

4,556,958

DEVICE FOR SINGLE LINE BIDIRECTIONAL DATA TRANSMISSION BETWEEN AN INTELLIGENT CARD'S MICROPROCESSOR AND A SECOND PROCESSOR

Michel Ugon, Maurepas, France, assignor to Compagnie International pour l'Informatique Cii-Honeywell Bull (Societe Anonyme), Paris, France

Continuation of Ser. No. 262,607, May 11, 1981, abandoned. This application Oct. 4, 1984, Ser. No. 657,471

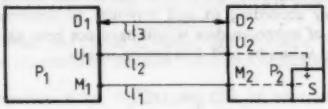
Claims priority, application France, May 30, 1980, 80 12108

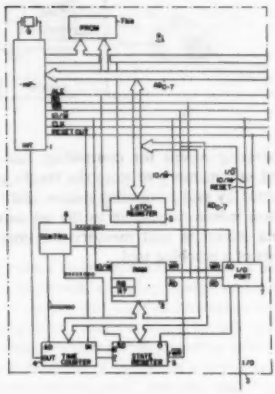
Int. Cl.⁴ G06F *15/16, 3/04, 11/10*

U.S. Cl. 364—200 **8 Claims**

1. A signal transmission device comprising first and second data processing stations, at least one of the stations being incorporated in a portable object, said portable object comprising a small plastic card embodying a microprocessor, each station having transmission means for transmitting, when in a transmission mode, a signal to the other station and having receiving means for receiving, when in a reception mode, a message transmitted from the other station; and means for coupling the stations together, the coupling means providing a single bidirectional signal line over which a message is transmitted in bit serial form by variations of a signal on the line; each station including first means for placing the line in a first predetermined state when such station is in the reception mode to advise the other station that it is ready to receive a message; second means, operative when the station is in the transmission mode, for detecting said predetermined state; third means controlled by said second means for generating and transmitting a start bit signal to the other station, the start bit signal preceeding a first bit of the message; fourth means operative when the station is in the transmission mode for calculating from the transmitted message a first parity bit and for transmitting the first parity bit to the other station; fifth means operative when the station is in the receiption mode for calculating a second parity bit from the received message and for comparing the first and second parity bits; and sixth means controlled

by said fifth means for placing the line in a second predetermined state different from the first predetermined state upon a





difference between said first and second parity bits being detected to advise the other station of a transmission error.

4,556,959

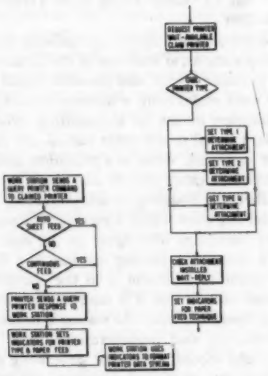
PRINTER SELECTION OF OPTIONS

Wade H. Allen, Austin; Theodore M. Cory, Leander, and Raymond A. Thornton, Austin, all of Tex., assignors to International Business Machines Corp., Armonk, N.Y.

Filed Mar. 29, 1983, Ser. No. 480,009

Int. Cl.⁴ G06F *3/12, 3/14*

U.S. Cl. 364—900 **3 Claims**



3. In an electronic office equipment network having a plurality of work stations and a plurality of printers connected to a network bus, said printers having various paper feeding options installed which must be specified in order for a work station to properly format the printer data steam and control a printer, said network further comprising a printer resource means for receiving requests for a printer from the work stations and notifying a work station when a printer becomes available so that the printer can be claimed by the work station, said printers including means for sensing the paper feeding options installed and transmitting over said network bus to a requesting work station information identifying the paper feeding option installed, wherein the process of specifying printer paper feeding option thereby claiming a printer by a work station for properly formatting the printer data stream and control the printer comprises the steps of:

displaying a plurality of choices of said paper feeding options including the choice of current paper feeding option installed;

manually selecting one of the plurality of choices of said paper feeding options thereby claiming a printer;

interrogating the printer by the work station when the choice of the current paper feeding option installed is chosen to determine what paper feeding option is installed on the printer;

sensing by the printer the paper feeding option which is installed on the printer and responding to said interrogation by the work station by transmitting over said network bus information identifying the paper feeding option that is installed; and

selecting by the work station indicators according to the paper feeding option identified by the printer so that the work station can properly format the printer data stream and control the printer during a print operation.

4,556,960

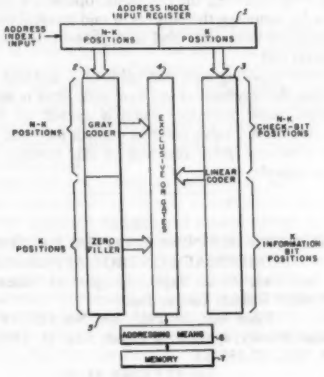
ADDRESS SEQUENCER FOR OVERWRITE AVOIDANCE

Martin Cohn, Arlington, and Terry A. Welch, Concord, both of Mass., assignors to Sperry Corporation, New York, N.Y.

Filed Dec. 13, 1982, Ser. No. 449,084

Int. Cl.⁴ G06F *9/38, 11/10*

U.S. Cl. 364—900 **24 Claims**



1. Apparatus for providing a sequence of address signals to an addressing means of a digital computer, wherein said addressing means accesses locations in memory of said digital computer, comprising:

address index input register for accepting an address index input and for providing a first signal comprising n—k bits and a second signal comprising k bits,

linear code sequence means for accepting said second signal and for generating a sequence of n dimensional binary words, said sequence comprising a repeating cycle of 2^k linear (n, k, d) code words, each linear code word comprising k data bits and n—k check bits, said k data bits occupying the same positions in each linear code word;

Gray code sequence means for accepting said first signal and

for generating a sequence of n−k dimensional binary words, said sequence of n−k dimensional binary words comprising words of a Gray code of dimension n−k, an individual Gray code word occurring consecutively 2^k times, and distinct Gray code words occurring in the order in which they appear in said Gray code;

zero filler means for generating a sequence of k dimensional binary words, each of said k dimensional binary words comprising k zero bits; and

Exclusive-OR additional means, coupled to receive said linear code sequence means generated n-dimensional binary words, said Gray code sequence means generated n−k dimensional binary words and said zero filler means generated k dimensional binary words for performing Exclusive-OR addition of the members of said sequence of n−k dimensional binary words to, respectively, said n−k check bits of the members of said sequence of n dimensional binary words, and for performing Exclusive-OR addition of the members of said sequence of k dimensional binary words to, respectively, said k data bits of the members of said sequence of n dimensional binary words, output of said Exclusive-OR addition means comprises said sequence of address signals whereby said address signals are applied to said addressing means for accessing said locations of said memory in accordance with said address signals.

4,556,961

SEMICONDUCTOR MEMORY WITH DELAY MEANS TO REDUCE PEAK CURRENTS

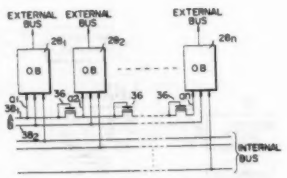
Hiroshi Iwahashi, Yokohama, and Masamichi Asano, Tokyo, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed May 19, 1982, Ser. No. 379,852

Claims priority, application Japan, May 26, 1981, 56-79551; Aug. 7, 1981, 56-123903

Int. Cl.⁴ G11C *11/40, 7/00*

U.S. Cl. 365—194 **2 Claims**



1. A semiconductor device comprising:

data supply means;

a plurality of output means, each connected to said data supply means;

means for causing all of said output means to change simultaneously from operation states to non-operation states, said simultaneous change causing means including a first control line through which a first control signal is transferred; and

delay means, connected to said plurality of output means, for causing said plurality of output means to operate and output data from said data supply means at different times in order to reduce peak instantaneous currents, said delay means including at least one depletion type MOS transistor whose conduction path is in series with a second control line through which a second control signal of said output means is transferred, the gate of said MOS transistor being connected to the end of said second control line to which said second control signal enters, and said second control signal changing levels in synchronism with said first control signal.

4,556,962

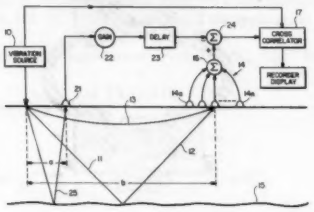
SEISMIC EXPLORATION METHOD AND APPARATUS FOR CANCELLING INTERFERENCE FROM SEISMIC VIBRATION SOURCE

Bernard Widrow, 860 Lathrop Dr., Stanford, Calif. 94305

Continuation of Ser. No. 289,309, Aug. 3, 1981, abandoned, and a continuation of Ser. No. 68,017, Aug. 20, 1974, abandoned. This application Apr. 21, 1983, Ser. No. 487,304

Int. Cl.⁴ G01V *1/36*

U.S. Cl. 367—45 **2 Claims**



1. A method of seismic exploration comprising the steps of

generating and applying seismic wave to the surface of the earth, said waves traveling into the earth and reflecting from formations in the earth and also traveling along the surface of the earth,

placing at least one receiving seismic detector on the surface of the earth spaced on the surface of the earth from the point of application of said waves to receive reflected seismic wave and unwanted surface waves and generate signals corresponding thereto,

generating a monitoring or reference signal representative of the applied seismic waves,

delaying said reference signal by an amount Δ_1,

adaptively processing said delayed reference signal to introduce a memory span delay equal to Δ_2 whereby the time delay between the generated seismic waves and the processed delayed reference signal is equal to the time required for a surface seismic wave to travel from the source of applied seismic waves to the at least one receiving detector, and

combining the processed reference signal with the output signals from the at least one seismic detector, the processing of said reference signal being such that the processed signal subtracts the surface wave signal and shallow reflected wave signals from the detector signals to provide an output signal representative of the seismic waves reflected from deeper formations.

4,556,963

UNDERWATER SOUND GENERATOR

George D. Hugus, Orlando, and A. Mark Young, Winter Park, both of Fla., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 1, 1982, Ser. No. 445,875

Int. Cl.⁴ G01V *1/38, 1/04;* **H04B** *11/00*

U.S. Cl. 367—143 **10 Claims**

1. A non-resonant sound generator, for use in a liquid, comprising:

(a) A rigid housing substantially impervious to the liquid, with one or more piston apertures through its walls;

(b) A piston that fits within each piston aperture and contacts said liquid on the exterior side of said housing;

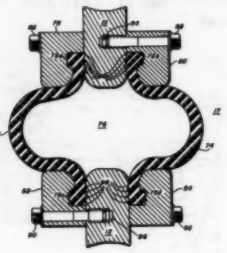
(c) Dynamic seal assemblies, substantially impervious to the liquid, joining the peripheries of said pistons to the boundaries of said piston apertures, to form a seal against the liquid;

(d) A space within said housing in which a gas may be present, defined by the housing, pistons, and dynamic seal assemblies;

(e) power means for moving said pistons perpendicularly to said piston apertures;

(f) control means for regulating the movement of said pistons by said power means, said control means allowing for the adjustment of the frequency of piston movement; and

(g) pressure regulating means for maintaining the pressure within said housing interior relative to the pressure of said liquid;



wherein, the mass and stiffness of elements (b), (e), and (f) are chosen such that any mechanically resonant frequencies are above the selected operating frequency of the sound generator; and

wherein each of the said dynamic seal assemblies comprises a flexible, convoluted seal and means for compressing one side thereof against the housing.

4,556,964

TECHNIQUE FOR MONITORING GALVO ANGLE

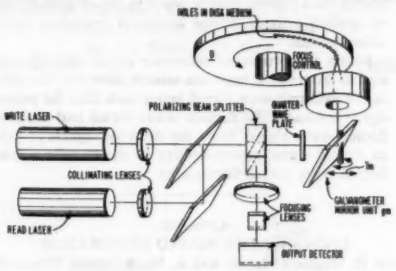
Paul M. Trethewey, Tarzana, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Filed Dec. 21, 1981, Ser. No. 332,500

The portion of the term of this patent subsequent to Aug. 14, 2001, has been disclaimed.

Int. Cl.⁴ G11B *7/00*

U.S. Cl. 369—44 **2 Claims**



1. In an optical data disk system where a radiant energy information laser beam of prescribed first wavelength is to be selectively positioned by rotatable scan-mirror means, the mirror means being arranged to provide a laser-reflecting mirror surface highly reflective of said laser information beam, this laser beam being comprised of:

a "write beam" and two "read beams", all adapted to be projected on a given, selected track of a rotating optical recording disk with a first read beam adapted for "read-before-write" function and the other read beam adapted for "read-after-write" function;

an improved method of providing rotation monitor means to automatically monitor the angular orientation of said mirror means, and provide an output signal reflecting this, this method comprising:

operatively associating reflector means with said mirror means to be rotated conjunctively therewith;

arranging related source means to comprise an LED source adapted to an IR monitor beam of prescribed second wavelength, and to project this beam to be reflected by said reflector means;

providing related detector means which includes active extended surface means which is adapted and disposed to receive said monitor beam whereby the angular rotation of said mirror means is converted to a prescribed linear displacement across this surface means so as to generate position signals representing the relative position of the monitor beam on the surface means;

arranging and disposing optical means intermediate said source means and said detector means so as to convert the angular rotation of said mirror means to linear displacement along said detector surface means; and

cooperatively arranging related utilization means adapted to process said position signals and generate said output signal for use in positioning said information beam; the utilization means including amplifying/processing circuit means disposed to be electro-magnetically shielded by said detect means and/or said source means;

while also adapting said mirror means to additionally include related monitor-reflector means disposed opposite thereto and adapted to reflect said monitor beam from said source means to said detector means so as to represent the angular rotation of said mirror surface during scanning of said laser beam as prescribed linear displacement on said detector surface means.

4,556,965

INFORMATION RECORDING APPARATUS HAVING AUTOMATIC FOCUSING

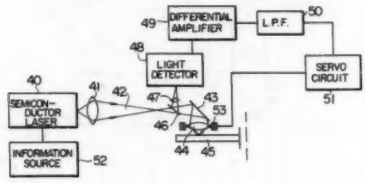
Yoshito Tsunoda, Mitaka; Toshimitsu Miyauchi, Hachioji, and Kazuo Shigematsu, Kawasaki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 22,947, Mar. 22, 1979, abandoned. This application Mar. 9, 1981, Ser. No. 241,728

Claims priority, application Japan, Apr. 7, 1978, 53-40334

Int. Cl.⁴ G11B *7/00, 21/10*

U.S. Cl. 369—45 **18 Claims**



1. An information recording apparatus comprising:

a light source of emitting a first light beam;

first means for applying predetermined recording information to said first light beam emitted from said light source to produce a pulsated light beam;

second means for irradiating said pulsated light beam onto a predetermined recording medium, said recording medium having a reflectivity thereto to said pulsated light beam which lowers below a predetermined value during the period of irradiation of said pulsated light beam as a result of the formation of a pit in said recording medium;

third means for detecting a second light beam which is a reflected version of said pulsated light beam from said recording medium before the reflectivity of said recording medium lowers below said predetermined value;

fourth means for producing an automatic focusing signal in accordance with an output from said third means, said automatic focusing signal having a predetermined fre-

quency relation to the frequency of the predetermined recording information so as to enable sampling of said automatic focusing signal by the frequency of the predetermined recording information, the predetermined frequency relation being that the frequency of said automatic focusing signal is equal to or lower than one-half of the frequency of the predetermined recording information; and

fifth means responsive to an output from said fourth means for focusing said pulsated light beam onto said recording medium.

4,556,966

INFORMATION CARRIER DISK WITH ANGULAR CODING MEANS AND A SYSTEM FOR DRIVING SAID DISK IN ROTATION

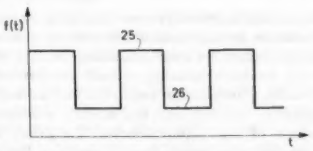
Claude Bricot; Pierre Berthet; Bruno Mertz, and Jean-Louis Gèrard, all of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Apr. 27, 1982, Ser. No. 372,333

Claims priority, application France, Apr. 27, 1981, 81 08333

Int. Cl.⁴ G11B *7/24, 7/00*

U.S. Cl. 369—52 **8 Claims**



1. A disk shaped data carrier having a centering hole and at least one prerecorded face wherein a first data is arranged along a set of turns having in common a geometric center, a first subset of said set of turns being allotted to the storage of said first data in adjacent track portions forming a pattern in registration with said first subset of turns, said prerecorded face comprising, around said centering hole;

a ring-shaped circular pattern of timing marks, wherein said marks are constituted by a second data which is related to a second subset of said set of turns with said second subset being separate and distinct from said first subset; said timing marks defining equal angular sectors bounded by radii crossing said common geometric center; each one of said angular sectors comprising at least one of said timing marks and a contiguous blank zone free from said second data, wherein said timing marks are made of strings of said second data arranged along the turns of said second subset.

4,556,967

RECORD CARRIER HAVING AN OPTICALLY READABLE INFORMATION STRUCTURE COMPRISED OF INFORMATION AREAS OF TWO DIFFERENT PHASE DEPTHS

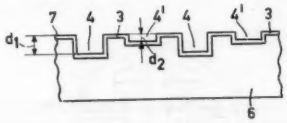
Josephus J. M. Braat, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Division of Ser. No. 315,692, Oct. 28, 1981, Pat. No. 4,455,632, which is a continuation of Ser. No. 179,334, Aug. 18, 1980, abandoned, which is a continuation-in-part of Ser. No. 419,640, Sep. 17, 1982, abandoned, which is a continuation of Ser. No. 214,538, Dec. 8, 1980, abandoned, which is a continuation of Ser. No. 925,433, Jul. 17, 1978, abandoned. This application Dec. 27, 1983, Ser. No. 565,994

Claims priority, application Netherlands, Apr. 25, 1980, 8002411

Int. Cl.⁴ G11B *7/00*

U.S. Cl. 369—275 **4 Claims**



1. A record carrier having an information structure which comprises optically readable information areas arranged in generally parallel information tracks, adjacent information track portions differing from each other in that one of said adjacent track portions contains information areas of a first phase depth and the other of said adjacent portions contains information areas of a second phase depth which differs from the first phase depth by approximately $\pi/2$ radians.

4,556,968

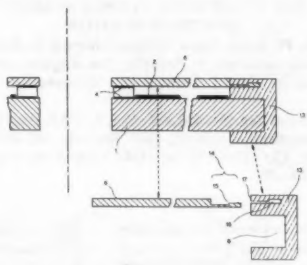
UNCONSTRAINED REMOVABLE PROTECTIVE COVER FOR OPTICAL DISK

Kathleen Pelkey, and Franklin Kalk, both of Boulder, Colo., assignors to Storage Technology Partners II, Louisville, Colo.

Filed Mar. 31, 1983, Ser. No. 481,009

Int. Cl.⁴ G01B *15/34;* G11B *7/00*

U.S. Cl. 369—287 **2 Claims**



1. An apparatus for attaching a slidable and removable protective cover to an optical information recording disk, thereby allowing for the differential expansion of the disk and the protective cover without warping or bending of said protective cover, said apparatus comprising:

an optical information recording disk;

a disk-shaped protective cover to be mounted above the disk media bearing surface, said protective cover having an upward projecting outer lip around the outer circumference of the outer rim of said protective cover;

a first inner spacer ring, disposed between the disk and the protective cover, and fixedly bonded to said disk and protective cover;

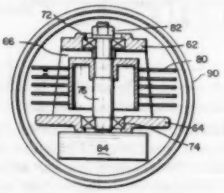
a second, outer spacer ring, said spacer ring having a U-shaped annular recess on the lower interior circumference of said spacer ring, into which the outer rim of the disk is slidably disposed, and having an upper U-shaped annular recess, said recess having a downward projecting lip, such that when the outer rim of the protective cover is inserted into the upper annular recess, the protective cover lip and the spacer ring cooperate to lock the disk into the spacer ring.

4,556,969

HERMETICALLY SEALED DISK FILE

Robert C. Treseder, Aptos, and Thomas G. Savarese, Sunnyvale, both of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 28, 1984, Ser. No. 687,215
Int. Cl.[4] G11B *5/82*; B65D *85/30*
U.S. Cl. 369—291 **6 Claims**



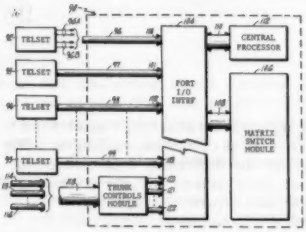
1. An improved hermetically sealed disk file, comprising:
at least one mounting plate;
a spindle having a first axis, said spindle being rotatably mounted on said mounting plate;
at least one disk mounted on said spindle for rotation about said first axis, said disk having a first outer diameter;
an elongated, cylindrical housing enclosing said mounting plate, spindle and disk, said housing having a second axis transverse to said first axis; and
means for attaching said mounting plate to said housing.

4,556,970

PBX TELEPHONE SYSTEM REMOTE SYNCHRONIZATION

Stephen D. Flanagin, Santa Monica; Howard G. Bubb, Woodland Hills, and John R. Scantlin, Los Angeles, all of Calif., assignors to United Technologies Corporation, Hartford, Conn.

Continuation of Ser. No. 432,884, Oct. 5, 1982, abandoned. This application Feb. 25, 1985, Ser. No. 705,394
Int. Cl.[4] H04Q *11/04*; H04J *3/00, 6/00, 3/06*
U.S. Cl. 370—58 **9 Claims**



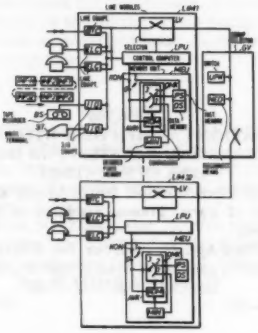
1. The method for controlling the time of arrival (TOA) at a central receiver of asynchronous serial bit signal information transmitted periodically from each of a plurality of signal sources in a full duplex system, comprising the steps of:
providing the central receiver with a master clock signal and a plurality of signal ports, one for each signal source;
establishing a desired time of arrival (TOA) for the information from each source at the associated signal port
regulating the actual time of departure (TOD) of the signal information transmitted periodically from each central receiver port to the associated source equipment;
delaying the return transmission from each source relative to the transmission TOD from the central receiver port by a delay time interval value selected to provide an actual time of arrival (TOA) at the associated port which is coincident with a desired TOA value.

4,556,971

APPARATUS FOR LOADING MEMORIES IN A TELECOMMUNICATION EXCHANGE

Thomas Thyni, Stockholm, Sweden, assignor to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

PCT No. PCT/SE82/00417, § 371 Date Aug. 8, 1983, § 102(e) Date Aug. 8, 1983, PCT Pub. No. WO83/02209, PCT Pub. Date Jun. 23, 1983
PCT Filed Dec. 7, 1982, Ser. No. 525,033
Claims priority, application Sweden, Dec. 15, 1981, 8107510
Int. Cl.[4] H04Q *11/04*
U.S. Cl. 370—58 **1 Claim**



1. In a telecommunications system comprising a plurality of similar line modules for communication with terminals and at least one group selector for interconnecting the line modules, each of said line modules including at least a controlled selector means for setting lines connected to the line module and to said group selector, wherein each line module is assigned to a different position of said group selector, the group selector establishing the communications from at least one line module to the other line modules in response to received position numbers, a control computer including an operation memory unit for controlling said controlled selector means, the improvement for facilitating the loading of data information into the operation memories of the line modules comprising a start up memory for storing a prerecorded start up program in each of the line modules, the prerecorded start up program of said at least one of the line modules controlling the associated control computer to be responsive to an external data source for transmitting data information therefrom to the group selector, the prerecorded start up program in the start up memories of at least said other line modules controlling the associated control computers to receive data information from the group selector, comparator means in each of at least said other line modules for comparing stored information—number designators with received information—number designators and upon equality emitting a control signal, means in each of at least said other line modules for storing information—number designators, a switch means in each of at least said other line modules for controllably connecting the associated control computer to its

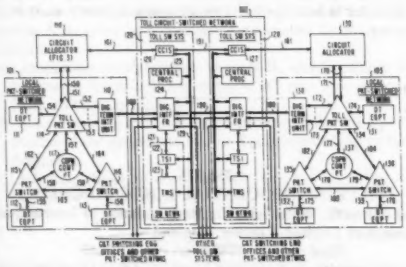
operations memory in response to control signals received from the associated comparator means whereby received data information are stored in said operation memory, and a data source connected to said at least one line module for first serially transmitting thereto sets of information words wherein the first information word of the set is a position number for controlling said group selector to establish a connection to a particular other line module and the second information word of the set is a group of information—number designators to be stored by said particular other line module, and second serially transmitting thereto another set of information words each prefixed by an information—number designator and followed by data information whereby the information words of said other set are fed to all of said other line modules so that the operation memories of said other line modules receive the data information associated with the stored information—number designators under control of the associated comparator means.

4,556,972

ARRANGEMENT FOR ROUTING DATA PACKETS THROUGH A CIRCUIT SWITCH

Dominic K. Chan, Glen Ellyn; Kwok P. Lee, Naperville, and Ronald B. Martin, Bolingbrook, all of Ill., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Dec. 27, 1983, Ser. No. 565,230
Int. Cl.⁴ H04Q *11/04*; H04J *3/16*
U.S. Cl. 370—60 **21 Claims**



1. An arrangement for routing data packets through a circuit switch; comprising:

a packet switch having a plurality of output links connected to said circuit switch and memory means for storing the identity of said output links designated for use to a particular destination;

said circuit switch having a plurality of channels to said particular destination and means for interconnecting said designated output links with a number of said channels equal to the number of said output links designated for use to said particular destination; and

allocator means responsive to data packets on said designated output links for causing said packet switch to change the number of said output links designated for use to said particular destination when the overall use of said designated output links reaches a threshold.

4,556,973

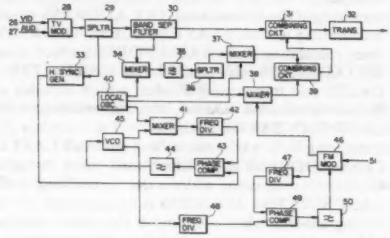
FREQUENCY-DIVISION MULTIPLEX COMMUNICATION METHOD AND SYSTEM

Hiroki Uemura, Tokyo, Japan, assignor to Pioneer Electronic Corp., Tokyo, Japan

Filed Nov. 9, 1983, Ser. No. 550,153
Claims priority, application Japan, Nov. 9, 1982, 57-196596
Int. Cl.⁴ H04J *1/14*; H04Q *11/04*
U.S. Cl. 370—69.1 **5 Claims**

1. A frequency-division multiplex communication method of a type wherein a data signal is multiplexed with a TV signal, in which the improvement comprises the steps of:

for transmitting, inserting into a composite TV signal a modulated audio signal and at least one signal, having a first carrier signal shifted a predetermined frequency relative to a second carrier signal of said modulated audio signal, said one signal being inserted in a frequency band assigned to audio signals within said TV signal; FM modulating said first carrier signal with a data signal; combining the modulated data signal with said modulated audio signal prior to said inserting; and



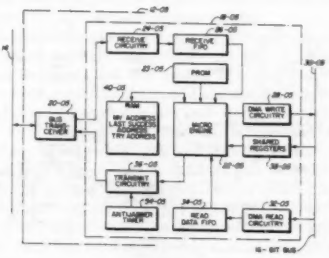
for reception, frequency separating signals contained in said frequency band; separating the modulated data signal from said separated signals in said frequency band by means of an intercarrier signal arising between said modulated audio signal and said at least one carrier signal; and FM detecting the separated data signal.

4,556,974

METHOD FOR PASSING A TOKEN IN A LOCAL-AREA NETWORK

Tony J. Kozlik, Phoenix, Ariz., assignor to Honeywell Inc., Phoenix, Ariz.

Filed Oct. 7, 1983, Ser. No. 540,062
Int. Cl.⁴ H04J *3/16*
U.S. Cl. 370—89 **6 Claims**



1. The method by which in an initialized token-passing local-area network one module of a plurality of modules of the network which has the token offers the token to another module, comprising the steps of:

transmitting, upon receipt of a token including as a destination address its MY ADDRESS, information, if available, and a token including as a destination address the transmitting module's LAST SUCCESS ADDRESS if its LAST SUCCESS ADDRESS equals its MY ADDRESS plus one;

transmitting a token including, as a destination address, the transmitting module's TRY ADDRESS if its LAST SUCCESS ADDRESS does not equal its MY ADDRESS plus one;

storing the transmitting module's TRY ADDRESS as its LAST SUCCESS ADDRESS if the transmitted token including as the token's destination address the transmit-

ting module's TRY ADDRESS is accepted by the module whose address is that of the transmitting module's TRY ADDRESS; and calculating and storing as the transmitting module's new TRY ADDRESS its MY ADDRESS plus one;

incrementing the transmitting module's TRY ADDRESS by one and storing this incremented address as its new TRY ADDRESS if the token transmitted including its TRY ADDRESS as the token's destination address, is not accepted;

determining if the incremented TRY ADDRESS equals the transmitting module's LAST SUCCESS ADDRESS; if it does, calculating a new TRY ADDRESS which equals its MY ADDRESS plus one, storing the new TRY ADDRESS and transmitting a token which includes as the token's destination address, the transmitting module's LAST SUCCESS ADDRESS;

incrementing by one the transmitting module's LAST SUCCESS ADDRESS if the transmitted token including as the token's destination address the transmitting module's LAST SUCCESS ADDRESS is not accepted and transmitting another token including as the token's destination address the transmitting module's incremented LAST SUCCESS ADDRESS;

repeating the previous step until a module accepts the token, the destination address of the token so accepted being the transmitting module's current LAST SUCCESS ADDRESS;

storing its current LAST SUCCESS ADDRESS; and

terminating operation of the module if the module's current LAST SUCCESS ADDRESS equals its MY ADDRESS.

4,556,975

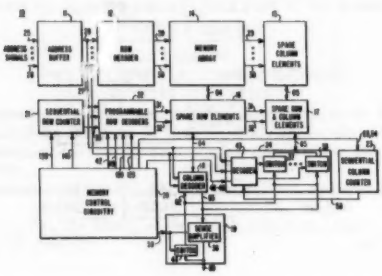
PROGRAMMABLE REDUNDANCY CIRCUIT

Teresa B. Smith, and Philip C. Smith, both of Columbia, Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 7, 1983, Ser. No. 464,259

Int. Cl.[4] G11C *7/00*

U.S. Cl. 371—10 **8 Claims**



1. A semiconductor memory for storing information and for substituting spare memory cells in place of faulty memory cells, said memory comprising:

an array of memory cells arranged in a plurality of rows and columns;

a non-programmable row decoder adapted for receiving address signals and having output lines coupled to corresponding rows of memory cells of said array;

a column decoder adapted for receiving address signals for selecting a column of memory cells of said array and adapted for coupling said column to a sense amplifier during read operations and to a data signal during write operations;

a first programmable row decoder coupled to said address signals and having an output coupled to a first row of spare memory cells in said array of memory cells, said first programmable row decoder including variable threshold transistors for programming said first programmable row decoder with first control signals to respond, on its output, to a first address signal;

means for inhibiting the address dependent output lines of said non-programmable row decoder when said first programmable row decoder responds to said first address signal;

a second programmable row decoder coupled to said address signals and having an output coupled to a second row of spare memory cells in said array of memory cells, said second programmable row decoder including variable threshold transistors for programming said second programmable row decoder to respond, on its output, to a second address signal;

means for inhibiting the address dependent output lines of said non-programmable row decoder when said second programmable row decoder responds to said second address signal; and

first and second sequencer circuits respectively coupled to said first and second programmable row decoders, with each sequencer circuit including means for generating control signals which enable programming of said first programmable row decoder when a row of spare memory cells is desired, and which permits inhibiting of programming of said first programmable row decoder and enabling of programming of said second programmable row decoder when another row of spare memory cells is desired.

4,556,976

CHECKING SEQUENTIAL LOGIC CIRCUITS

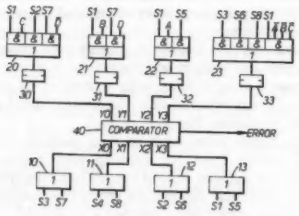
James Howarth, Whitefield, England, assignor to International Computers Limited, London, England

Filed Jul. 27, 1983, Ser. No. 517,643

Claims priority, application United Kingdom, Aug. 14, 1982, 8223437

Int. Cl.[4] G06F *11/00*

U.S. Cl. 371—25 **9 Claims**



1. A sequential logic circuit having checking means comprising:

a first encoder responsive to the current state of the circuit, for producing a first code dependent on that state;

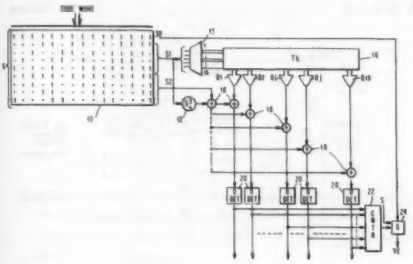
a second encoder responsive to the state of the circuit prior to a transition to a different state and also to the signal or signals effective to cause that transition, for producing a second code indicating a predicted value for the first code in the next state; and

means for comparing the first code produced in a current state with the second code produced for the transition to that state and indicating if there is any discrepancy between them.

4,556,977
DECODING OF BCH DOUBLE ERROR CORRECTION - TRIPLE ERROR DETECTION (DEC-TED) CODES

Ulrich Olderdissen, Herrenberg, and Hans Schumacher, Schönaich, both of Fed. Rep. of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 15, 1983, Ser. No. 532,639
Int. Cl.[4] G06F *11/10*
U.S. Cl. 371—37 2 Claims



1. In an error correcting system based on a BCH multiple error correction code with α as a primitive element of the finite field GF (2^m) and with an H matrix where each column vector CK includes two m-tuples α^k and α^{3k} a method of locating bit positions K in error in a codeword generated by such a code comprising:

(a) generating subsyndrome vectors S_1 and S_2 where S_1 is generated from column m-tuple α^k and S is generated from column m-tuple α^{3k},

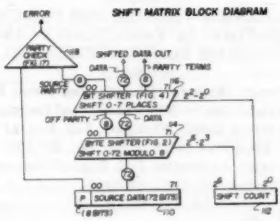
(b) generating Q_K for each bit position by generating permutations of the syndrome vector S_1 corresponding to the bit positions,

(c) selecting those bit positions K where $S_1^3+S_2+Q_K=0$ as the bit or bits in error.

4,556,978
ERROR CHECKED HIGH SPEED SHIFT MATRIX

Glen R. Kregness, Minnetonka; Peter B. Criswell, Bethel, and Clarence W. DeKarske, St. Paul Park, all of Minn., assignors to Sperry Corporation, New York, N.Y.

Filed Jul. 20, 1983, Ser. No. 515,401
Int. Cl.[4] G06F *11/10*
U.S. Cl. 371—49 17 Claims



1. An error-checked, high speed shift matrix for use in the arithmetic portion of a contemporary data processing system comprising:

(a) a data source means having a parity information portion;

(b) a byte shifter capable of right or left shifting, connected to said data source means, capable of bidirectionally shifting multiple bit portions of said data received therefrom, and of producing an output signal indicative of the parity of the number of bits shifted off in either a right or a left shift;

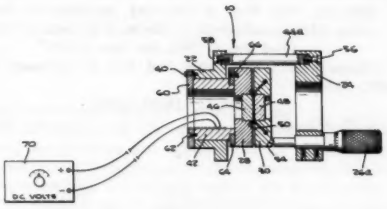
(c) a bit shifter, connected to said byte shifter, capable of shifting single bits of said data received therefrom and of producing a predicted source parity output signal; and

(d) a parity checking and error indicating comparing means commonly connected to said bit shifter and said data source means to receive predicted source parity information from said bit shifter and actual source parity information from said parity information portion of said data source, to compare said actual source parity with said predicted source parity and to provide an error indication when said comparison operation indicates inequally.

4,556,979
PIEZOELECTRICALLY TUNED SHORT CAVITY DYE LASER

Gary W. Scott, Riverside, and Aaron J. Cox, Redlands, both of Calif., assignors to University of California, Berkeley, Calif.

Filed Nov. 8, 1982, Ser. No. 439,757
Int. Cl.[4] H01S *3/10*
U.S. Cl. 372—20 8 Claims



1. An electrically tuned short cavity dye laser comprising:

a resonant optical cavity including longitudinally translatable input mirror means for receiving laser light and longitudinally translatable output mirror means disposed in closely spaced relation to said input mirror means for transmitting laser light;

an active laser dye pumped by pulses from another laser and disposed in said resonant optical cavity;

piezoelectric translator means having a length responsive to an applied voltage and coupled to one of said mirror means for finely and electrically adjusting the length of said cavity responsively to said voltage by longitudinally translating said mirror means such that the wavelength of axial cavity modes of said laser can be precisely and continuously tuned by varying said applied voltage and said laser can be operated in both single and multiple modes;

mechanical means coupled to the other of said mirror means for coarsely and mechanically adjusting the length of said cavity by longitudinally translating said mirror means; and

support means, including a base, for supporting said mirror means for said longitudinal movement.

4,556,980
LASER LIGHT SOURCES

David W. Smith, Woodbridge, and Richard Wyatt, Ipswich, both of England, assignors to British Telecommunications, London, England

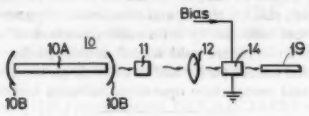
Filed Feb. 3, 1983, Ser. No. 463,501
Claims priority, application United Kingdom, Feb. 5, 1982, 8203314
Int. Cl.[4] H01S *3/10*
U.S. Cl. 372—28 19 Claims

1. An injection-locked pair of optical lasers which together provide a coherent light source comprising:

gas laser means for generating a narrow linewidth first coherent light output,

semiconductor laser means biased for generating a less-narrow linewidth second coherent light output serving as the coherent output of said light source; and

injection-locking means for injecting at least a portion of the narrow linewidth first coherent light output into the semiconductor laser means so as to injection-lock the semiconductor laser means into a predetermined mode of lasing operation which stabilizes said second coherent light output at a predetermined wavelength and linewidth.



4,556,981

LASER OF THE TE TYPE, ESPECIALLY A HIGH-ENERGY LASER

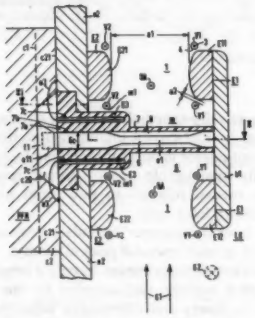
Hans-Jürgen Cirkel; Willi Bette, and Reinhard Müller, all of Erlangen, Fed. Rep. of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mülheim, Fed. Rep. of Germany

Filed Sep. 8, 1982, Ser. No. 416,017

Claims priority, application Fed. Rep. of Germany, Sep. 14, 1981, 3136447

Int. Cl.[4] H01S *3/097*

U.S. Cl. 372—86 **18 Claims**



1. A laser of the TE type, comprising: a gas-tight housing defining a discharge chamber, at least two first and second laser electrodes disposed parallel to the optical axis of the laser within said housing of said discharge chamber, a gas space between and defined by said laser electrodes, said electrodes being disposed mutually opposite and at a given distance from each other, excitation of the laser being provided by an arc-free capacitor discharge being highly homogeneous in said gas space between said electrodes, a pre-ionization device disposed within said housing of said discharge chamber, current leads and a current return conductor disposed in said housing of said discharge chamber, each of said electrodes being connected to one of said current leads and current return conductor, means for conducting laser gas through said discharge chamber, a pulse-forming network having a capacitor contact surface and being connected to said current leads and current return conductor, each of said mutually opposite laser electrodes having at least two subelectrodes, said subelectrodes of one of said electrodes facing toward said pulse-forming network and said subelectrodes of the other of said electrodes facing away from said pulse-forming network, an electrode bridge connected to said subelectrodes of said electrodes facing away from said pulse-forming network, said subelectrodes of said respective mutually opposite electrodes defining subdischarge spaces therebetween and a subelectrode space between said subdischarge spaces, and insulation jackets disposed on said current leads, said jacketed current leads being extended from said electrode bridge through said subelectrode space, through said current return conductor and to said capacitor contact surface.

4,556,982

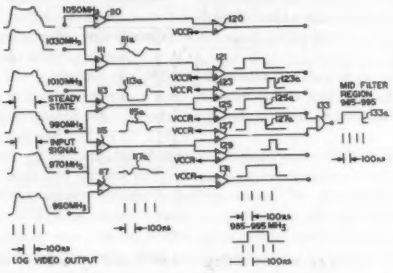
ENERGY DISCRIMINATING CHANNEL SELECT LOGIC

Robert H. Dunn, Thousand Oaks, Calif., assignor to Eaton Corporation, Cleveland, Ohio

Filed Jun. 27, 1983, Ser. No. 508,379

Int. Cl.[4] H04B *1/16, 17/00*

U.S. Cl. 375—10 **7 Claims**



1. A method for determining the instantaneous narrow band frequency of a radio signal variable over a wide frequency band, comprising the steps of:

detecting the energy level of said radio signal within each of a plurality of adjacent narrow band frequency channels;

comparing the energy levels detected by each pair of adjacent narrow band channels to produce a plurality of difference signals. each difference signal being indicative of the difference between energy levels of said radio signal in a unique pair of adjacent narrow band channels;

selecting a threshold amplitude greater than the amplitudes of said difference signals during periods of energy splatter produced by edge portions of a received radio signal in pulse form;

comparing the amplitude of each of said difference signals with said threshold amplitude to produce a plurality of logic signals; and

processing said plurality of logic signals to determine the narrow band frequency of said radio signal.

4,556,983

METHOD AND APPARATUS FOR PRE-EMPHASIS COUNTERACTION OF VARIATIONS IN AMPLITUDE OF RECEIVED OR REPRODUCED SERIAL BINARY SIGNALS

Jürgen Heitmann, Alsbach-Hähnlein, and Horst Rickenbrock, Seeheim-Jugenheim, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Nov. 2, 1983, Ser. No. 547,918

Claims priority, application Fed. Rep. of Germany, Nov. 11, 1982, 3241648; Dec. 27, 1982, 3248196

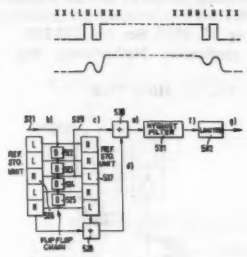
Int. Cl.[4] H04B *1/62*

U.S. Cl. 375—60 **11 Claims**

1. Method of correcting amplitude variations in the reception or reproduction of digital electric signals comprising the steps of:

storing digital signal sequences of signal patterns known to be subject to variation in amplitude of pulses received or reproduced by reason of peak amplitude shift occurring in signal sequences having great differences in the length of intervals between transitions from one binary signal level to the other and storing also identification of pulses of said stored signal sequences which unless broadened are likely if transmitted to be received or reproduced with deficient signal amplitude;

detecting said patterns in a stream of binary digital signals to be transmitted or recorded, by the comparison of said stored digital signal sequences with said data stream;



selecting pulses of detected signal sequences of said patterns in said data stream which unless broadened are likely to received or reproduced with deficient signal amplitude, and

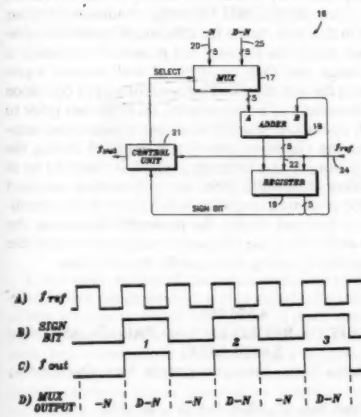
broadening only said selected pulses of said data stream.

4,556,984

FREQUENCY MULTIPLIER/DIVIDER APPARATUS AND METHOD

Thad J. Genrich, Morrison, Colo., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 27, 1983, Ser. No. 565,268
Int. Cl.[4] H03L 7/08
U.S. Cl. 377—47 **7 Claims**



1. Clocked frequency multiplier/divider (FMD) apparatus, having first and second frequency select inputs and a reference frequency input, said apparatus comprising:

an adder having a first input, a second input, an output and a carry output;

a register having an input, a carry input, a clock input, a carry output and an output, said input being coupled to said output of said adder, said carry input being coupled to said carry output of said adder, said clock input being coupled to said reference input of said FMD and said output being coupled to said second input of said adder;

selecting means for selecting one of said first and second frequency select inputs of said FMD;

control means for controlling said selecting means; and

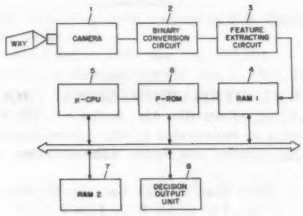
an output having a predetermined relationship to said reference frequency input.

4,556,985

PATTERN RECOGNITION APPARATUS

Yasuo Hongo, Hino, Japan, assignor to Fuji Electric Company, Inc., Japan

Filed Jun. 14, 1983, Ser. No. 504,263
Claims priority, application Japan, Jun. 28, 1982, 57-109746
Int. Cl.[4] G06K 9/12
U.S. Cl. 382—30 **1 Claim**



1. A pattern recognition apparatus comprising:

means for obtaining a M×N bit pattern matrix B(i,j) representing the presence and configuration of an unknown scanned pattern in subregions (i,j) of a frame which substantially encloses the scanned pattern, and for determining the general center of a pattern and for forming a frame having a certain size generally centered on said pattern center, wherein each bit in the pattern has a pattern present value when the scanned pattern falls at least partially within its associated subregion or a pattern absent value when the scanned pattern does not fall within its associated subregion;

means for comparing the bit pattern matrix with a plurality of previously obtained bit pattern matrices $B_S^K(i,j)$ for a respective plurality of known reference patterns K, and for outputting for each reference pattern K a comparison quantity value D^K whose amplitude represents the degree of correspondence between the bit pattern matrix B(i,j) for the unknown pattern and the bit pattern matrices $B_S^K(i,j)$ for each reference pattern K according to the formula:

$$D^K = \sum_{i=1}^{M} \sum_{j=1}^{N} B_S^K(i,j) + [B_M^K(i,j) \text{ AND } D^K(B(i,j))],$$

where:

D^K is a deformation matrix operator for the reference pattern K which replaces a pattern absent bit value in B(i,j) with a pattern present bit value for all subregion bits in each bit string, if at least one of the bits in the respective bit string which includes the bit under consideration has a pattern present value,

$B_M^K(i,j)$ is a mask bit matrix for the reference pattern K which contains pattern absent bit values at positions which do not significantly aid in distinguishing the pattern K from another pattern, thereby enabling the identification process to ignore the value of this bit obtained directly from the scan, and

$B_S^K(i,j)$ is a standard bit matrix for the reference pattern K which contains pattern present bits at positions where an ideal reference pattern K would at least partially occupy the corresponding subregion positions, and which contains pattern absent bits where an ideal reference pattern K would not have any of its portion occupying the corresponding subregion positions;

means for selecting the lowest and next lowest comparison quantity values and for outputting a pattern identification

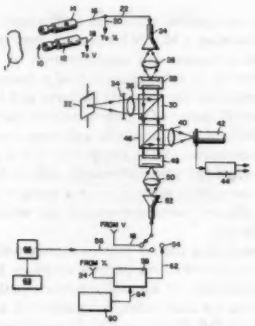
signal which identifies the unknown pattern as the reference pattern corresponding to the lowest comparison quantity value if this lowest comparison quantity value is less than a first preset value, and if the difference between the lowest and next lowest comparison quantity values is greater than a second preset value wherein the values of comparison quantity values are generally inversely proportional to the degree of correspondence between the bit matrix pattern and the reference pattern matrices.

4,556,986

OPTICAL STEREO VIDEO SIGNAL PROCESSOR

Glenn D. Craig, Huntsville, Ala., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Mar. 9, 1983, Ser. No. 473,499
Int. Cl.[4] G06K 9/00; H04N 7/18
U.S. Cl. 382—42 23 Claims



1. A method for obtaining parallax data, such as the range of a particular target, including the steps of:

(a) producing first and second representations of the target, the first representation being slightly offset from said second representation;

(b) displaying said first and second representations of the target, on respective first and second displays;

(c) directing a polarized and collimated beam of light at the output planes of a first liquid crystal light valve and a second liquid crystal light valve;

(d) directing the information provided on the face of said first display to the input plane of said first liquid crystal light valve and the information provided on the face of said second display to the input plane of a second liquid crystal light valve, said present step being performed simultaneously with directing the polarized and collimated beam of light at the output planes of said first and second liquid crystal light valve;

(e) superimposing the images produced on the output planes of said first and second liquid crystal light valves on a video detector, wherein the images produced on the output planes of said first and second liquid crystal light valves are proportional to the images impressed on the input planes of said first and second liquid crystal light valves; and

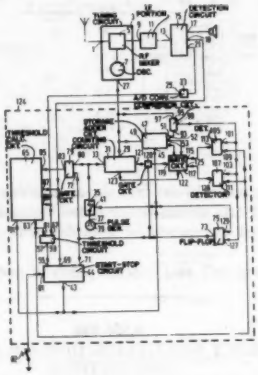
(f) producing a peak correlation signal on said video detector, said peak correlation signal being indicative of the range of the target.

4,556,987

RECEIVER COMPRISING A SEARCH TUNING CIRCUIT

Theodoor A. J. Schlösser, and Theodorus H. Smakman, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 17, 1983, Ser. No. 523,525
Claims priority, application Netherlands, Sep. 1, 1982, 8203414
Int. Cl.[4] H03J 7/18
U.S. Cl. 455—161 1 Claim



1. A receiver having a search tuning circuit and means for effecting a presearch operation in a desired wave-band for establishing a receiving condition criterion for use in a subsequent search operation by said search tuning circuit to locate a transmission which satisfies said receiving condition criterion, characterized in that said means for effecting a presearch operation comprises means for limiting said presearch operation to a frequency range less than one-fifth of said desired wave-band, and means for initiating said subsequent search operation either at the frequency of a transmission received last prior to said presearch operation, when at least one transmission satisfying the receiving condition criterion is detected during the presearch operation, or at a frequency which is removed by at least one receiver bandwidth from the transmission received last prior to said presearch operation when no receiving condition criterion is detected during the presearch operation, the receiver bandwidth being the frequency range over which the receiver is capable of tuning to a specific transmission.

4,556,988

INDOOR UNIT OF RECEIVER FOR BROADCASTING SATELLITE

Akiyuki Yoshisato, Soma, Japan, assignor to Alps. Electric Co., Ltd., Japan

Filed Sep. 27, 1983, Ser. No. 536,355
Claims priority, application Japan, Sep. 27, 1982, 57-167873
Int. Cl.[4] H04B 1/26
U.S. Cl. 455—182 3 Claims

1. An indoor unit of a receiver which receives radio waves transmitted from a broadcasting satellite and group-converts the received radio waves into a first intermediate frequency signal which is then fed to said indoor unit for conversion into a second intermediate frequency signal; the indoor unit having a single superheterodyne structure comprising:

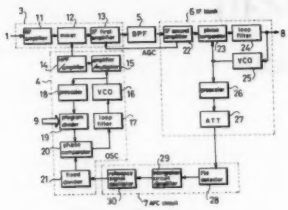
a mixer for converting the first IF signal into the second IF signal;

a first VCO coupled to and driving the mixer;

an IF amplifier for coupling the second IF signal out from the mixer;

a PLL demodulator having a phase comparator, a loop filter and a second VCO, wherein a first portion of the VCO

output is coupled to the phase comparator, and the input of said PLL demodulator is coupled to the IF amplifier output; and an AFC circuit coupled to a second portion of the output of said second VCO and generating a control signal for controlling the frequency of the first VCO;



wherein the frequency of said second IF signal is selected sufficiently high so that an image frequency thereof is not included within the receiving range of the IF amplifier and a prescaler for dividing the second portion of the output of said second VCO, the prescaler being interposed between the output of the second VCO and the AFC circuit and supplying a divided-down signal to said AFC circuit.

4,556,989

RADIO SYSTEM

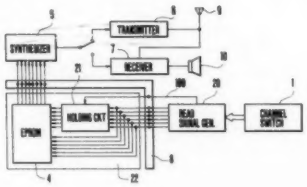
Hironao Matsuoka, Mitaka, and Kazuo Suzuka, Sayama, both of Japan, assignors to Hitachi Denshi Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 1, 1983, Ser. No. 547,710

Claims priority, application Japan, Nov. 5, 1982, 57-167559[U]

Int. Cl.⁴ H04B *1/16*

U.S. Cl. 455—183 **3 Claims**



1. In a radio system of the type comprising read signal generating means for generating a read signal comprising a plurality of bits, a memory circuit for storage of data, means for supplying said read signal to said memory circuit for reading out said data, and a synthesizer for producing a frequency determined by said read out data, the improvement wherein said read signal supplying neons comprises a holding circuit packaged on a substrate together with said memory circuit, said substrate being independent of other substances carrying other circuit elements, said holding circuit having an output coupled to said memory circuit and input terminal means, and wherein said read signal generating means includes means coupled to said input terminal means of said holding circuit for sending out said read signal in at least two successive multi-bit portions, a first portion being stored in said holding circuit and forming a first memory circuit address portion and a second portion by passing said holding circuit and thereby being coupled directly to said memory circuit and forming a second memory circuit address portion.

4,556,990

TUNER

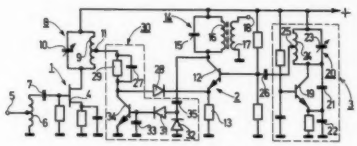
Rudolf Hasler, Vienna, Austria, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 6, 1983, Ser. No. 511,378

Claims priority, application Austria, Jul. 8, 1982, 2663/82

Int. Cl.⁴ H04B *1/26*

U.S. Cl. 455—333 **5 Claims**



1. A tuner for furnishing an intermediate frequency signal in response to a received radio frequency signal, comprising:

preamplifier circuit means for receiving said radio frequency signal;

means for furnishing a local oscillator signal;

mixing means connected to said preamplifier means and said local oscillator furnishing means and comprising a transistor having a base circuit connected to receive said local oscillator signal, a collector circuit for furnishing said intermediate frequency signal, and an emitter circuit having an emitter resistor and carrying emitter current, said mixing means having a gain varying inversely with direct current through said emitter resistor;

a diode connected between said preamplifier circuit and said mixing means for conducting said radio frequency signal from said preamplifier circuit means to said mixing means, said diode having an impedance varying as a function of a bias voltage applied thereto;

means connecting said diode to said emitter resistor so that current flowing through said diode flows through said emitter resistor in the same direction as said emitter current; and

control circuit means connected to said diode and said mixing means for receiving said intermediate frequency signal and furnishing a bias voltage increasing said impedance of said diode in response to increases in said intermediate frequency signal, whereby increases in said intermediate frequency signal increase said impedance of said diode thus decreasing said radio frequency signal applied to said mixer stage and changing said current through said emitter resistor in a direction decreasing said gain of said mixing means.

DESIGN PATENTS

GRANTED DEC. 3, 1985

ERRATA

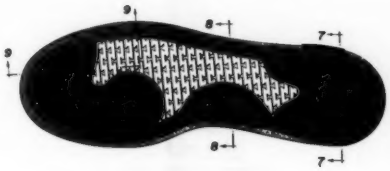
For CLASS	See PATENT NO.
D11–032	281,585

281,540
BABY PANTS
Maj I. Ternström, Gothenburg, Sweden, assignor to Molnlycke Aktiebolag, Gothenburg, Sweden
Filed Jul. 12, 1983, Ser. No. 513,003
Claims priority, application Sweden, Jan. 12, 1983, 83-0092
Term of patent 14 years
U.S. Cl. D2—10

281,541
DENIM JACKET
Flo Kerr, 555 Main St., Roosevelt Island, N.Y. 10044
Filed Jul. 18, 1983, Ser. No. 514,680
Term of patent 14 years
U.S. Cl. D2—191

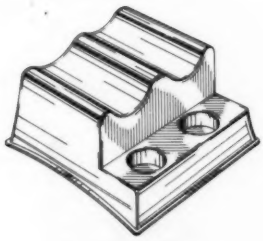
281,542
SHOE SOLE
Toshio Iwakata, Yoshii, Japan, assignor to Nippon Rubber Co., Ltd., Tokyo, Japan
Filed Dec. 30, 1983, Ser. No. 566,930
Term of patent 14 years
U.S. Cl. D2—320

281,543
SHOE SOLE
Yoshinori Nagano, Ohnojo, Japan, assignor to Nippon Rubber Co., Ltd., Tokyo, Japan
Filed Jul. 18, 1983, Ser. No. 514,833
Claims priority, application Japan, Jan. 20, 1983, 58-2242
Term of patent 14 years
U.S. Cl. D2—320



281,544
SPOOL HOLDER
Richard T. Michell, Alpharetta, and Charles A. Sperling, Marietta, both of Ga., assignors to Yours Truly, Inc., Atlanta, Ga.
Filed Dec. 27, 1983, Ser. No. 566,121
Term of patent 14 years
U.S. Cl. D3—26

281,545
COMBINED VEHICLE SEAT ARM REST AND DRINK HOLDER
Michael L. Flanagan, 6096 TaraWood Dr., Orlando, Fla. 32811
Filed Jun. 1, 1983, Ser. No. 499,839
Term of patent 14 years
U.S. Cl. D3—40



281,546

INSULATED BAG

Charlotte S. Bradshaw, 344 139th Ave., San Leandro, Calif. 94578

Filed May 18, 1983, Ser. No. 495,747

Term of patent 14 years

U.S. Cl. D3—53

281,547

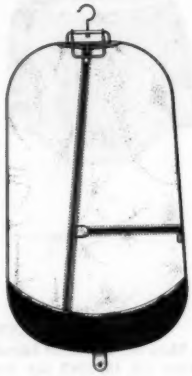
GARMENT BAG

Harvey Bomes, Wellesley Hills; John Pulichino, Wellesley, both of Mass.; John Migliore, Barrington, R.I., and Jack Barber, Cambridge, Mass., assignors to American Tourister, Inc., Warren, R.I.

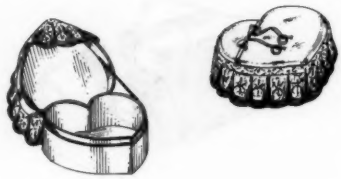
Filed Aug. 18, 1983, Ser. No. 524,212

Term of patent 14 years

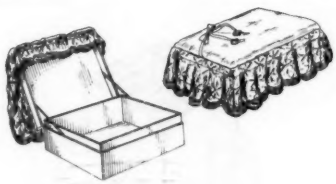
U.S. Cl. D3—71



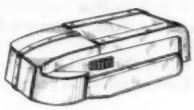
281,548
RING CUSHION MEMENTO CHEST
Richard Minsky, 109-03 86th Ave., Richmond Hill, N.Y. 11418
Filed Jun. 24, 1983, Ser. No. 507,573
Term of patent 14 years
U.S. Cl. D3—78



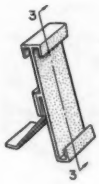
281,549
RING CUSHION MEMENTO CHEST
Richard Minsky, 109-03 86th Ave., Richmond Hill, N.Y. 11418
Filed Jun. 24, 1983, Ser. No. 507,575
Term of patent 14 years
U.S. Cl. D3—78



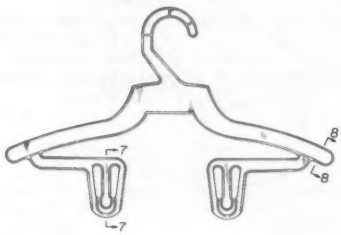
281,550
SHOE BUFFER
John S. Doyel, 404 W. 20th St., New York, N.Y. 10011
Filed Nov. 16, 1983, Ser. No. 552,439
Term of patent 14 years
U.S. Cl. D4—102



281,551
MINIATURE PICTURE FRAME
Robert S. Wallace, 823 S. Longwood Ave., Los Angeles, Calif. 90005
Filed Jul. 18, 1983, Ser. No. 514,586
Term of patent 14 years
U.S. Cl. D6—310

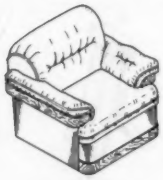


281,552
COMBINED HANGER FOR SKIRTS OR TROUSERS AND SHOULDERED GARMENTS OR THE LIKE
Jack M. Zuckerman, Forest Hills, and John Warmath, Brooklyn, both of N.Y., assignors to Cut Rate Plastic Hangers, Inc., Brooklyn, N.Y.
Filed Jan. 19, 1979, Ser. No. 4,724
Term of patent 14 years
U.S. Cl. D6—318



281,553
INFANT SEAT
Robert I. Glawe, 1020 Kaplan Dr., Waterloo, Iowa 50702
Continuation-in-part of Ser. No. 292,690, Aug. 13, 1981. This application Jun. 8, 1983, Ser. No. 502,197
Term of patent 14 years
U.S. Cl. D6—333

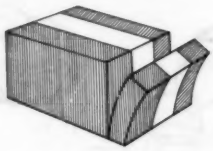
281,554
SEAT
Walter E. Stuenkel, Morganton, N.C., assignor to Bassett Furniture Industries, Inc., Bassett, Va.
Filed May 31, 1984, Ser. No. 615,940
Term of patent 14 years
U.S. Cl. D6—334



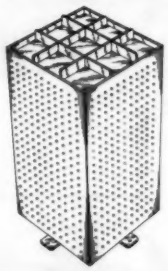
281,555
COMBINATION FOLDING BED AND LAP TRAY
Edward Levy, Franklin Lakes, N.J., assignor to Marley Tile, A.G., Zug, Switzerland
Filed Sep. 24, 1982, Ser. No. 422,607
Term of patent 14 years
U.S. Cl. D6—406

281,556
MOBILE CABINET FOR VIDEO GAME AND ACCESSORIES
Clarence R. Duncan, Jr., 305 Kemp Rd. West, Greensboro, N.C. 27410
Filed Apr. 19, 1982, Ser. No. 369,527
Term of patent 14 years
U.S. Cl. D6—429

281,557
COFFEE TABLE
C. Lee Payne, Jr., 801 Durant Pl., NE., Atlanta, Ga. 30309
Filed Jul. 18, 1983, Ser. No. 514,727
Term of patent 14 years
U.S. Cl. D6—449

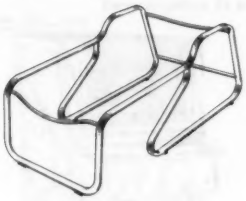


281,558
ROTATING TOOL STORAGE CABINET
Jerry G. Cartwright, Ellwood City, Pa., assignor to Wesco Manufacturing, Inc., Aurora, Ill.
Filed Aug. 23, 1982, Ser. No. 410,851
The portion of the term of this patent subsequent to Feb. 5, 1999, has been disclaimed.
Term of patent 14 years
U.S. Cl. D6—469



281,559
TABLE
Edsel E. Murry, Christiana, Tenn., assignor to Samsonite Corporation, Denver, Colo.
Filed Jul. 5, 1983, Ser. No. 511,045
Term of patent 14 years
U.S. Cl. D6—487

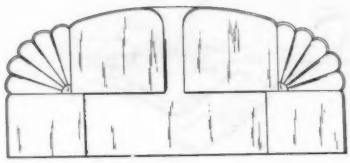
281,560
BASE FOR CHAISE LOUNGE OR THE LIKE
Edsel E. Murry, Christiana, Tenn., assignor to Samsonite Corporation, Denver, Colo.
Filed Jul. 5, 1983, Ser. No. 511,046
Term of patent 14 years
U.S. Cl. D6—501



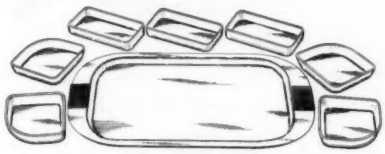
281,561
CANOPY FOR A BED OR SIMILAR ARTICLE
Nils O. Litens, Furutorp, S-795 00 Rättvik, Sweden
Filed Mar. 18, 1983, Ser. No. 476,800
Term of patent 14 years
U.S. Cl. D6—503

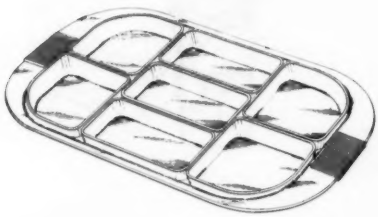
281,562
BASE FOR A CHAIR OR THE LIKE
Edsel E. Murry, Christiana, Tenn., assignor to Samsonite Corporation, Denver, Colo.
Filed Jul. 5, 1983, Ser. No. 511,047
Term of patent 14 years
U.S. Cl. D6—501

281,563
BED BOARD
Roger Rougier, 105 de Louvain St., Montreal, Quebec, Canada H2N 1A3
Filed Apr. 16, 1984, Ser. No. 600,516
Term of patent 14 years
U.S. Cl. D6—505



281,564
COMBINED HORS-D'OEUVRE SERVING TRAY AND DISHES
Ambrogio Pozzi, Gallarate, Italy, assignor to F.LLI Guzzini S.p.A., Recanati, Italy
Filed Jan. 3, 1983, Ser. No. 455,022
Claims priority, application Italy, Jul. 16, 1982, 22421/82[U]
Term of patent 14 years
U.S. Cl. D7—3



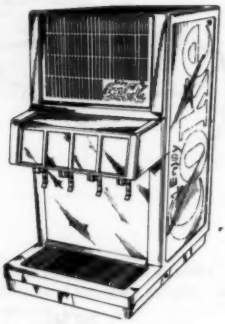


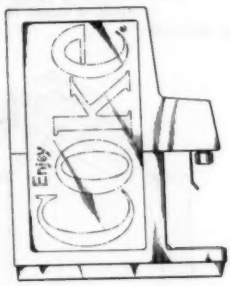
281,565
STEM GLASS HOLDER
Virginia Stourton, 3 Elm Lodge, River Gardens, Stevenage Rd., London, England SW6 6NZ, and Michael C. Clear, 44 Green St., London, England W1Y 3FJ
Filed Jan. 18, 1983, Ser. No. 458,841
Term of patent 14 years
U.S. Cl. D7—39

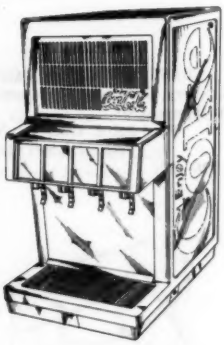
281,566
CUTTING BOARD
Ronald J. Gangelhoff, Mound, Minn.; Robert L. Jacobi, Lake Geneva, Wis.; William Peters, Maple Grove, Minn., and Robert Pashley, Lake Geneva, Wis., assignors to Chicago Cutlery Consumer Products, Inc., Minneapolis, Minn.
Filed Apr. 20, 1983, Ser. No. 486,694
Term of patent 14 years
U.S. Cl. D7—46

281,567
INSULATING VESSEL
Anso Zimmermann, Bad Hersfeld, Fed. Rep. of Germany, assignor to Rotpunkt Dr. Anso Zimmermann, Niederaula, Fed. Rep. of Germany
Filed Oct. 12, 1982, Ser. No. 433,648
Claims priority, application Fed. Rep. of Germany, Apr. 21, 1982, MR 173; Finland, Sep. 16, 1982, 823/82
Term of patent 14 years
U.S. Cl. D7—77

281,568
BEVERAGE DISPENSER CABINET
Robert D. Bruffey, Jr., Lilburn; Samuel C. Crosby, Decatur; Lorraine E. Gaunt, Symrna, and George H. Hoover, Stone Mountain, all of Ga., assignors to The Coca-Cola Company, Atlanta, Ga.
Filed Aug. 22, 1983, Ser. No. 525,107
Term of patent 14 years
U.S. Cl. D7—308





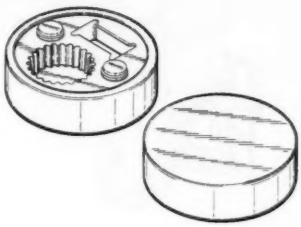


281,569
INSULATED JUG
Anso Zimmermann, Bad Hersfeld, Fed. Rep. of Germany, assignor to Rotpunkt Dr. Anso Zimmermann, Niederaula, Fed. Rep. of Germany
Filed Oct. 27, 1982, Ser. No. 437,007
Claims priority, application Fed. Rep. of Germany, May 10, 1982, MR 177
Term of patent 14 years
U.S. Cl. D7—317

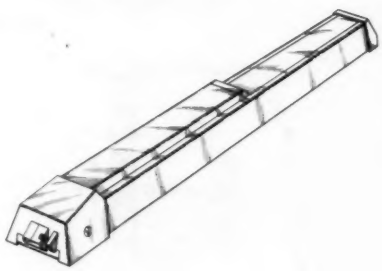
281,570
INSULATED JUG
Anso Zimmermann, Bad Hersfeld, Fed. Rep. of Germany, assignor to Rotpunkt Dr. Anso Zimmermann, Niederaula, Fed. Rep. of Germany
Filed Oct. 27, 1982, Ser. No. 437,005
Claims priority, application Fed. Rep. of Germany, May 10, 1982, MR 178
Term of patent 14 years
U.S. Cl. D7—321

281,571
MICRO-FEEDER TUBE FOR PLANT INJECTION DEVICE
Dale I. Dodds, Pasadena, Calif., assignor to J. J. Mauget Co., Burbank, Calif.
Continuation-in-part of Ser. No. 301,939, Sep. 14, 1981, Pat. No. Des. 273,265. This application Nov. 28, 1983, Ser. No. 555,348
Term of patent 14 years
U.S. Cl. D8—1

281,572
BOTTLE OPENER
Kori F. Gabriel, R.R. No. 3, Qualicum Beach, British Columbia, Canada (V0R 2T0), and Wojtek T. Tomaszewski, 302 - 1772 Comox St., Vancouver, British Columbia, Canada (V6G 1P8)
Filed Sep. 19, 1983, Ser. No. 533,228
Term of patent 14 years
U.S. Cl. D8—40



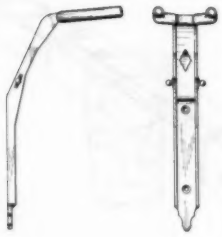
281,573
EXIT OPERATOR
Theodore H. Miller, New Britain, Conn., assignor to Emhart Industries, Inc., Farmington, Conn.
Filed May 16, 1983, Ser. No. 495,272
Term of patent 14 years
U.S. Cl. D8—302



281,574
CORD REEL
Joseph T. O'Hara, II, 4112 Pennsylvania, Kansas City, Mo. 64111
Filed Nov. 18, 1983, Ser. No. 553,076
Term of patent 14 years
U.S. Cl. D8—358

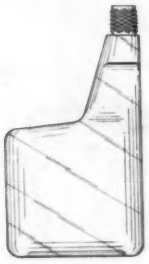
281,575
HANGER BRACKET AND HOOK THEREFOR
John P. Chap, Lemont, Ill., assignor to Selfix, Inc., Chicago, Ill.
Division of Ser. No. 327,354, Dec. 4, 1981. This application Dec. 17, 1984, Ser. No. 682,292
Term of patent 14 years
U.S. Cl. D8—363

281,576
WALL MOUNTED GUITAR BRACKET
Ronald L. Akers, R.R. 2, Box 321, Lawson, Mo. 64062
Filed Jun. 27, 1983, Ser. No. 507,754
Term of patent 14 years
U.S. Cl. D8—373



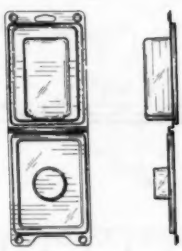
281,577
PLASTIC BOTTLE
Craig A. Larson, Westfield Court, and Richard C. Darr, Seville, both of Ohio, assignors to Plastipak Packaging, Inc., Plymouth, Mich.
Filed Jan. 17, 1983, Ser. No. 458,321
Term of patent 14 years
U.S. Cl. D9—367

281,578
BOTTLE OR SIMILAR ARTICLE
Hermann Reidel, Mainaschaff, Fed. Rep. of Germany, assignor to CWS AG, Baar, Switzerland
Filed Mar. 21, 1983, Ser. No. 477,392
Claims priority, application Hague, Nov. 25, 1982, DM/002016
Term of patent 14 years
U.S. Cl. D9—375

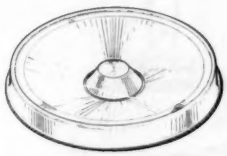


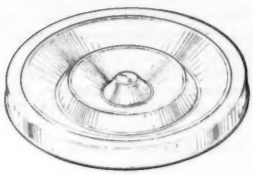
281,579
JUG OR SIMILAR ARTICLE
Archie G. Drummond, Jr., Palatine, and Dale E. Fahnstrom, Riverside, both of Ill., assignors to Tone Brothers, Inc., Des Moines, Iowa
Filed Mar. 25, 1983, Ser. No. 478,875
Term of patent 14 years
U.S. Cl. D9—376

281,580
PACKAGING CONTAINER FOR ELECTRICAL SWITCHES
James T. Stevens, San Antonio, Tex., assignor to Power Controls Corp., San Antonio, Tex.
Filed Dec. 9, 1983, Ser. No. 559,957
Term of patent 14 years
U.S. Cl. D9—415

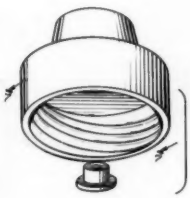


281,581
CONTAINER CLOSURE
George E. MacEwen, c/o Sealright Co., Inc., 605 W. 47th St., Kansas City, Mo. 64112
Filed Dec. 7, 1982, Ser. No. 447,542
Term of patent 14 years
U.S. Cl. D9—435

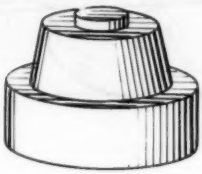




281,582
COMBINED RECEPTACLE CAP AND CAPSULE PIERCING DEVICE THEREFOR
Florence Borkan, Morristown, N.J., and Thomas A. Cafiero, Brooklyn, N.Y., assignors to Pharmacaps, Inc., Elizabeth, N.J.
Division of Ser. No. 415,975, Sep. 8, 1982, Pat. No. Des. 278,033. This application Oct. 17, 1984, Ser. No. 661,824
Term of patent 14 years
U.S. Cl. D9—437

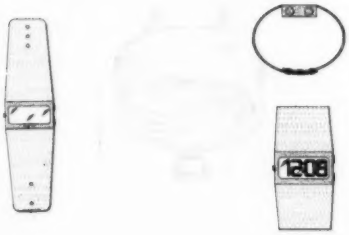


281,583
COMBINED RECEPTACLE CAP AND CAPSULE PIERCING DEVICE THEREFOR
Thomas A. Cafiero, Brooklyn, N.Y., and Florence Borkan, Morristown, N.J., assignors to Pharmacaps, Inc., Elizabeth, N.J.
Division of Ser. No. 415,976, Sep. 8, 1982, Pat. No. Des. 278,034. This application Oct. 17, 1984, Ser. No. 661,825
Term of patent 14 years
U.S. Cl. D9—437

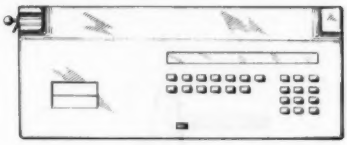


281,584
TEAR OPEN BOTTLE CAP
Jan Berglund, Västra Frölunda, Sweden, assignor to Wicanders AG, Zug, Switzerland
Filed Mar. 16, 1983, Ser. No. 475,832
Claims priority, application United Kingdom, Jan. 31, 1983, 1011161; Jan. 31, 1983, 1011162; Jan. 31, 1983, 1011163; Jan. 31, 1983, 1011164
Term of patent 14 years
U.S. Cl. D9—438

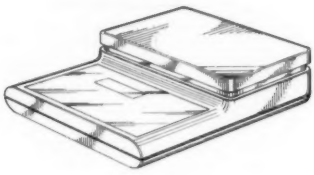
281,585
WRIST WATCH
Agostino Vittadini, 155 E. 77th St., Apt. #4F, New York, N.Y. 10021
Filed Feb. 25, 1985, Ser. No. 704,782
Term of patent 14 years
U.S. Cl. D11—32



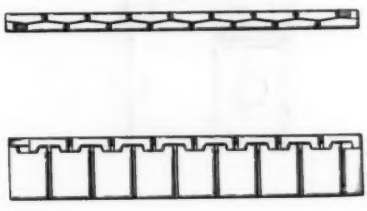
281,586
ELECTRONIC SCALE FOR MEASURING GOLF CLUB PARAMETERS
Thomas B. Chandler, 1380 W. 48th St., Unit 18, San Bernardino, Calif. 92407
Filed Nov. 9, 1983, Ser. No. 550,119
Term of patent 14 years
U.S. Cl. D10—91



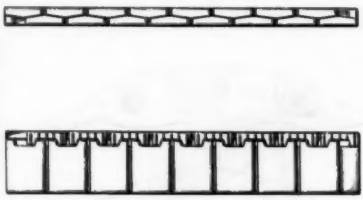
281,587
POSTAGE SCALE
Rido Busse, Elchingen, Fed. Rep. of Germany, assignor to Soehnle-Waagen GmbH & Co., Murrhardt, Fed. Rep. of Germany
Filed Jan. 10, 1984, Ser. No. 569,676
Term of patent 14 years
U.S. Cl. D10—91



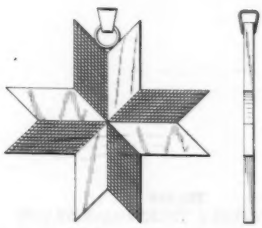
281,588
JEWELRY CHAIN
Masao Otake, Ichikawa, Japan, assignor to Nakagawa Corporation, Tokyo, Japan
Filed Jun. 10, 1983, Ser. No. 503,402
Claims priority, application Japan, Sep. 18, 1982, 57-42308
Term of patent 14 years
U.S. Cl. D11—12



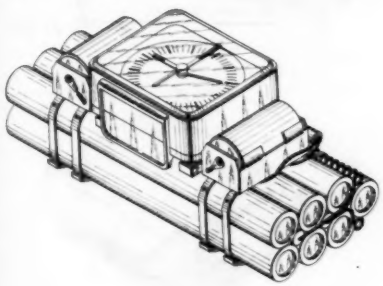
281,589
JEWELRY CHAIN
Masao Otake, Ichikawa, Japan, assignor to Nakagawa Corporation, Tokyo, Japan
Filed Jun. 10, 1983, Ser. No. 503,257
Claims priority, application Japan, May 31, 1983, 58-23166
Term of patent 14 years
U.S. Cl. D11—12



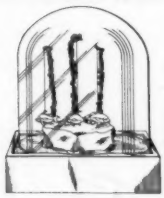
281,590
PENDANT
Modris M. Treibachs, 324 Marengo St., Forest Park, Ill. 60130
Filed Jul. 7, 1981, Ser. No. 281,078
Term of patent 14 years
U.S. Cl. D11—79



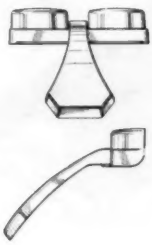
281,591
SIMULATED TIME BOMB
Gary J. Hikiss, 1237 Yale St., No. 6, Santa Monica, Calif. 90404
Filed Aug. 22, 1983, Ser. No. 524,999
Term of patent 14 years
U.S. Cl. D11—157



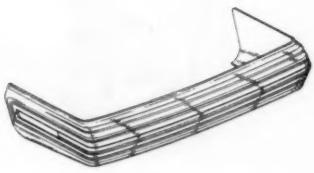
281,592
AQUATIC SCULPTURE OR SIMILAR ARTICLE
Otto Grun, 44 Cocoanut Row, Palm Beach, Fla. 33480
Filed Oct. 31, 1983, Ser. No. 547,075
Term of patent 14 years
U.S. Cl. D11—135



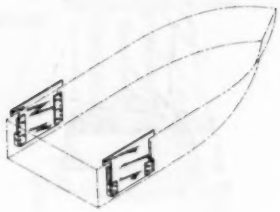
281,593
MOTORCYCLE CARBURETOR AND WIRE COVER
James M. Preisler, Mound; Alwin J. Stahel, St. Paul, and Thomas H. Rudd, Wayzata, all of Minn., assignors to Drag Specialties, Inc., Minneapolis, Minn.
Filed Mar. 22, 1983, Ser. No. 478,047
Term of patent 14 years
U.S. Cl. D12—126



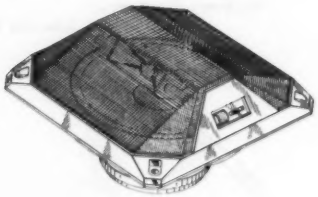
281,594
REAR BUMPER FOR AN AUTOMOBILE
Richard A. Teague, Franklin; Robert C. Nixon; George M. Krispinsky, both of Huntington Woods; Jack E. Kenitz, New Baltimore, and Gary D. Guichard, Dearborn Heights, all of Mich., assignors to American Motors Corporation, Southfield, Mich.
Filed Sep. 30, 1982, Ser. No. 432,155
Term of patent 14 years
U.S. Cl. D12—169



281,595
PAIR OF STABILIZERS FOR SMALL BOAT
Chris Fulster, 2810 3rd Ave., Sacramento, Calif. 95818
Filed Nov. 13, 1984, Ser. No. 670,840
Term of patent 14 years
U.S. Cl. D12—317

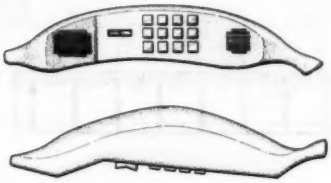


281,596
LOUDSPEAKER
Takekazu Iijima, Tokyo, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan
Filed Jul. 25, 1983, Ser. No. 516,492
Claims priority, application Japan, Jan. 28, 1983, 58-3154
Term of patent 14 years
U.S. Cl. D14—30

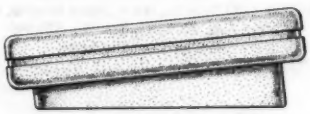


281,597
LOUDSPEAKER
Hiroshi Matushima, Tokyo, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan
Filed Jul. 25, 1983, Ser. No. 516,499
Claims priority, application Japan, Jan. 28, 1983, 58-3153
Term of patent 14 years
U.S. Cl. D14—34

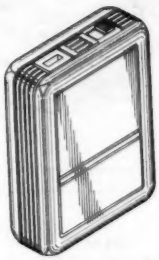
281,598
TELEPHONE HANDSET
John G. Guenther, 1635 N. Mohawk, Chicago, Ill. 60614
Filed Oct. 20, 1983, Ser. No. 543,769
Term of patent 14 years
U.S. Cl. D14—53



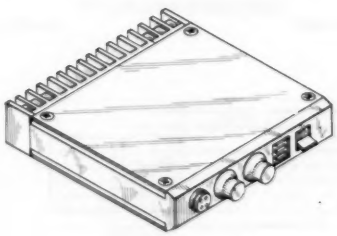
281,599
HOUSING FOR A TELEPHONE STAND
Richard M. Joffe, Palisades Park, N.J., and John N. McGarvey, Drexel, Pa., assignors to AT&T Technologies, Inc., Berkeley Heights, N.J.
Filed Feb. 4, 1985, Ser. No. 698,208
Term of patent 14 years
U.S. Cl. D14—62



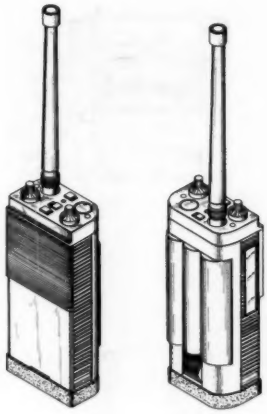
281,600
RADIO PAGER OR SIMILAR ARTICLE
Bruce A. Claxton, Coral Springs, Fla., and Richard K. Althans, Long Grove, Ill., assignors to Motorola, Inc., Schaumburg, Ill.
Filed Aug. 1, 1983, Ser. No. 519,452
Term of patent 14 years
U.S. Cl. D14—68



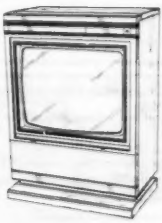
281,601
MOBILE RADIO HOUSING
James P. Liautaud, River & Buff Rds., Trout Valley, Cary, Ill. 60013; Peter F. Stultz, Elgin, Ill., and David L. Maloney, Barrington, Ill., assignors to James P. Liautaud, Cary, Ill.
Filed Sep. 6, 1983, Ser. No. 529,886
Term of patent 14 years
U.S. Cl. D14—68



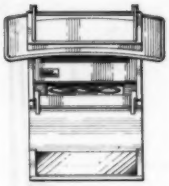
281,602
PORTABLE BATTERY OPERATED TRANSCEIVER
James P. Liautaud, River & Bluff Rds., Trout Valley, Cary, Ill. 60013; Peter F. Stultz, Elgin, Ill., and David L. Maloney, Barrington, Ill., assignors to James P. Liautaud, Cary, Ill.
Filed Sep. 6, 1983, Ser. No. 529,957
Term of patent 14 years
U.S. Cl. D14—68



281,603
TELEVISION RECEIVER
Yoshinori Harada, Osaka, and Yoshiaki Kawata, Hyogo, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Aug. 1, 1983, Ser. No. 519,344
Claims priority, application Japan, Feb. 4, 1983, 58-4319
Term of patent 14 years
U.S. Cl. D14—82

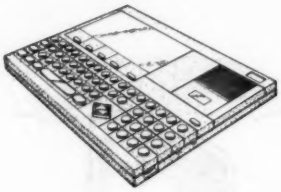


281,604
PROJECTION TELEVISION RECEIVER
Kozo Kawasaki, Ikeda, and Hiroyuki Katada, Hirakata, both of Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan
Filed Feb. 1, 1983, Ser. No. 462,926
Claims priority, application Japan, Aug. 9, 1982, 57-36216
Term of patent 14 years
U.S. Cl. D14—83



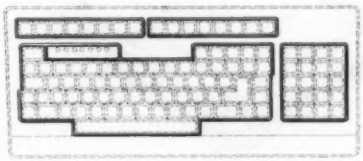
281,605
KEYBOARD
Nuccio Bertone, Turin, Italy, assignor to Northern Technologies Limited, Markham, Canada
Filed May 11, 1983, Ser. No. 493,471
Term of patent 14 years
U.S. Cl. D14—100

281,606
PORTABLE COMPUTERIZED UNIT
Michael J. Nuttall; William R. Burnett, both of Palo Alto, and Charles M. Fiorella, Sunnyvale, all of Calif., assignors to Convergent Technologies, Inc., Santa Clara, Calif.
Filed Aug. 19, 1983, Ser. No. 524,961
Term of patent 14 years
U.S. Cl. D14—100

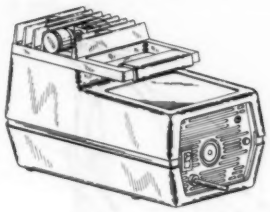


281,607
COMPUTER TERMINAL
Jerry C. Marino, Sudbury, and David E. Desilets, Hopkinton, both of Mass., assignors to Prime Computer, Inc., Natick, Mass.
Filed Feb. 9, 1983, Ser. No. 465,321
Term of patent 14 years
U.S. Cl. D14—106

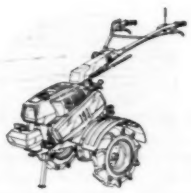
281,608
RAISED BORDER ARRANGEMENT FOR THE TOP SURFACE OF A KEYBOARD PANEL
Nuccio Bertone, Turin, Italy, assignor to Northern Technologies Limited, Markham, Canada
Division of Ser. No. 493,471, May 11, 1983. This application Nov. 21, 1984, Ser. No. 673,915
Term of patent 14 years
U.S. Cl. D14—115



281,609
AIR COMPRESSOR
Walter B. Herbst, Chicago, Ill., assignor to Thomas Industries Inc., Louisville, Ky.
Filed Jun. 10, 1983, Ser. No. 503,055
Term of patent 14 years
U.S. Cl. D15—9

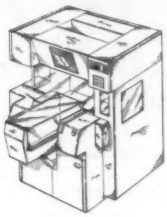


281,610
POWERED AGRICULTURAL APPARTUS
Kouichi Sasaki, Saitama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Aug. 11, 1983, Ser. No. 522,297
Claims priority, application Japan, Feb. 15, 1983, 58-5683
Term of patent 14 years
U.S. Cl. D15—12



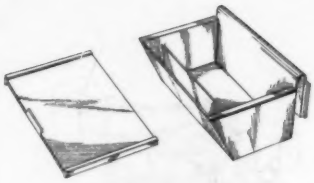
281,611
POWERED AGRICULTURAL APPARATUS
Yoshio Mikado, Saitama, Japan, assignor to Honda Giken Kogyo K.K., Tokyo, Japan
Filed Sep. 2, 1983, Ser. No. 529,181
Claims priority, application Japan, Apr. 11, 1983, 58-15287
Term of patent 14 years
U.S. Cl. D15—12

281,612
CABINET FOR ARMATURE WINDING MACHINE
Alvin C. Banner, Kettering; Hyman B. Finegold, Dayton, and David R. Seitz, Vandalia, all of Ohio, assignors to The Globe Tool & Engineering Company, Dayton, Ohio
Filed Jun. 17, 1983, Ser. No. 505,248
Term of patent 14 years
U.S. Cl. D15—122

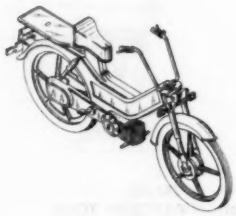


281,613
DESIGN PATTERN TOOL
Janie R. Kay, 23962 Via Onda, Valencia, Calif. 91355
Filed Mar. 24, 1983, Ser. No. 478,340
Term of patent 14 years
U.S. Cl. D19—39

281,614
COUPON FILE RECEPTACLE
Beverly J. Carpenter, and William R. Carpenter, both of 4288 Lake Harbor Rd., Muskegon, Mich. 49441
Filed Sep. 30, 1982, Ser. No. 429,555
Term of patent 14 years
U.S. Cl. D19—90



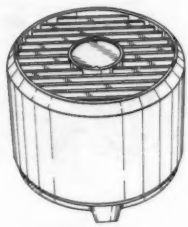
281,615
TOY MOTORBIKE OR SIMILAR ARTICLE
Michael W. Barbato, Hermosa Beach; Henry T. Hodges, Torrance, and Ray W. Mattson, Venice, all of Calif., assignors to Mattel, Inc., Hawthorne, Calif.
Filed Dec. 27, 1983, Ser. No. 565,677
Term of patent 14 years
U.S. Cl. D21—81



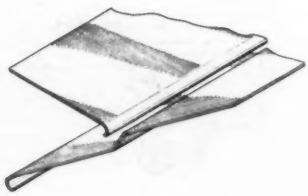
281,616
DECORATIVE WHEEL
Thayard A. McGuire, 8617 Parkway Cir., Riverview, Fla. 33569
Filed Sep. 30, 1982, Ser. No. 430,028
Term of patent 14 years
U.S. Cl. D21—101

281,617
PASSENGER SEAT FOR AN AMUSEMENT RIDE
Michael J. Thornalley, Lincoln, England, assignor to Fibrecast (UK) Limited, Lincoln, England
Filed Jan. 24, 1983, Ser. No. 460,455
Claims priority, application United Kingdom, Oct. 21, 1982, 1009348
Term of patent 14 years
U.S. Cl. D21—247

281,618
AIR CLEANER
Clifford E. Grube, Niles, Ill., assignor to Associated Mills, Inc., Chicago, Ill.
Filed Aug. 19, 1983, Ser. No. 524,660
Term of patent 14 years
U.S. Cl. D23—149

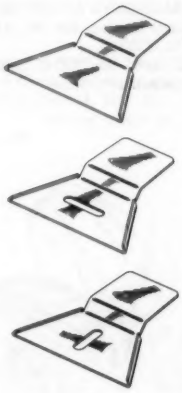


281,619
FLOOR FOR A SPRAY PAINT BOOTH
Jan-Mats Eneroth; Östen Määttti, and Roland Söderholm, all of Växjö, Sweden, assignors to Flakt Aktiebolag, Nacka, Sweden
Filed Nov. 19, 1982, Ser. No. 442,870
Claims priority, application Fed. Rep. of Germany, May 24, 1982, URA 601/82
Term of patent 14 years
U.S. Cl. D23—163

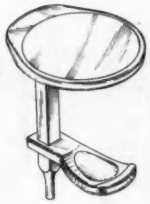


281,620
VENTURI WALL FOR WET SEPARATORS AND THE LIKE
Lennart Gustavsson, and Osten Maatta, both of S-Vaxjo, Sweden, assignors to Flakt Aktiebolag, Nacka, Sweden
Continuation-in-part of Ser. No. 220,734, Dec. 29, 1980. This application Jun. 28, 1983, Ser. No. 508,585
Claims priority, application Sweden, Jul. 4, 1980, 80-1336
Term of patent 14 years
U.S. Cl. D23—163

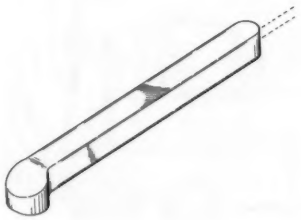
281,621
SUPPORTING PLATE FOR DENTAL IMPRESSIONS
Roland Weber, Grand-Chene 5, 1003 Lausanne, Switzerland
Filed Jul. 19, 1982, Ser. No. 399,724
Claims priority, application Hague, Feb. 4, 1982, DM/001,188
Term of patent 14 years
U.S. Cl. D24—10



281,622
COMBINED DENTAL MIRROR AND MOISTURE CONTROL APPARATUS
Michael K. Diamond, 86 Milburn La., Roslyn, N.Y. 11577
Filed Aug. 29, 1983, Ser. No. 526,996
Term of patent 14 years
U.S. Cl. D24—13

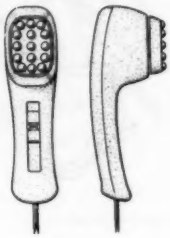


281,623
HAND HELD ULTRASONIC TRANSDUCER FOR PATIENT MONITORING USE
Stephen R. Barnes, Seattle, Wash., assignor to Lawrence Medical Systems, Inc., Redmond, Wash.
Filed Sep. 30, 1982, Ser. No. 430,117
Term of patent 14 years
U.S. Cl. D24—17



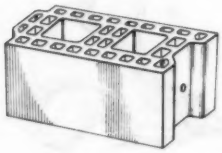
281,624
SURGICAL STAPLE REMOVER
Carlos J. Babini, West Hartford, Conn., assignor to United States Surgical Corporation, Norwalk, Conn.
Filed Mar. 30, 1983, Ser. No. 480,440
Term of patent 14 years
U.S. Cl. D24—26

281,625
ELECTRICALLY POWERED BODY MASSAGER
John S. Yuen, Kowloon, Hong Kong, assignor to John Manufacturing Limited, Kowloon, Hong Kong
Filed Oct. 5, 1982, Ser. No. 432,814
Claims priority, application United Kingdom, Apr. 8, 1982, 1006094
Term of patent 14 years
U.S. Cl. D24—41

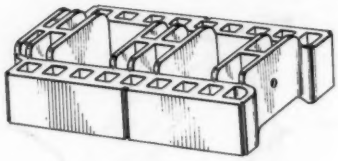


281,626
EXTENSION LADDER STEPDECK
Richard A. Dyer, 7706 SE. Maple Dr., Vancouver, Wash. 98664
Filed May 23, 1983, Ser. No. 497,266
Term of patent 14 years
U.S. Cl. D25—69

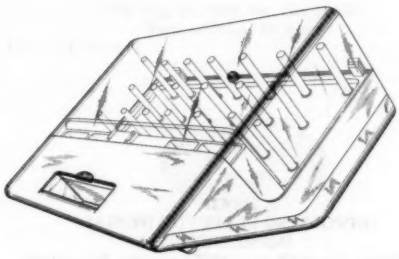
281,627
BUILDING BLOCK
Jose C. dos Santos, Estrada dos Arneiros, 46-1° Dto.,, Lisboa, Portugal
Filed Feb. 3, 1983, Ser. No. 463,476
Claims priority, application Portugal, Aug. 3, 1982, 15963
Term of patent 14 years
U.S. Cl. D25—88



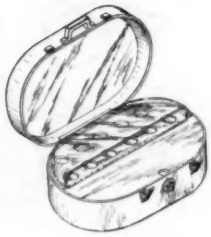
281,628
BUILDING BLOCK
Jose C. dos Santos, Estrada dos Arneiros, 46-1° Dto., Lisboa, Portugal
Filed Feb. 3, 1983, Ser. No. 463,477
Claims priority, application Portugal, Aug. 3, 1982, 15961; Aug. 3, 1982, 15962; Aug. 3, 1982, 15965; Aug. 3, 1982, 15967
Term of patent 14 years
U.S. Cl. D25—88



281,629
HAIRSETTER
Carl Yurdin, Port Washington, N.Y., assignor to Clairol Incorporated, New York, N.Y.
Filed Sep. 28, 1983, Ser. No. 536,486
Term of patent 14 years
U.S. Cl. D28—38



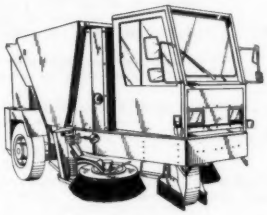
281,630
LIPSTICK BLENDING MACHINE
Eleanor R. Spierto, Midtown Towers, Apt. No. 1202, 643 Liberty Ave., Pittsburgh, Pa. 15222
Filed Mar. 21, 1983, Ser. No. 477,090
Term of patent 14 years
U.S. Cl. D28—99



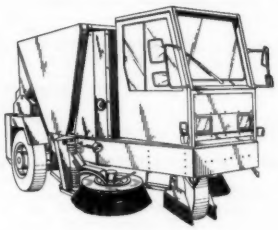
281,631
DOG LEASH HANDLE
Ronald C. Konar, 7280 S. Highland Dr., Littleton, Colo. 80120
Filed Oct. 5, 1983, Ser. No. 540,130
Term of patent 14 years
U.S. Cl. D30—39

281,632
POWER WASHER
Jack Yang, 833 Carillo Dr., San Gabriel, Calif. 91776
Filed Mar. 24, 1983, Ser. No. 478,317
Term of patent 14 years
U.S. Cl. D32—15

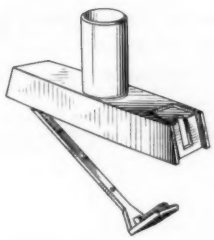
281,633
THREE WHEEL STREET SWEEPER WITH HIGH DUMP HOPPER
Thomas A. Pratt, Los Gatos, Calif., assignor to FMC Corporation, Chicago, Ill.
Filed May 23, 1983, Ser. No. 497,398
Term of patent 14 years
U.S. Cl. D32—16



281,634
THREE WHEEL STREET SWEEPER WITH LOW DUMP HOPPER
Thomas A. Pratt, Los Gatos, Calif., assignor to FMC Corporation, Chicago, Ill.
Filed May 23, 1983, Ser. No. 497,399
Term of patent 14 years
U.S. Cl. D32—16



281,635
MOP HEAD
Robert W. Machaek, Lombard, and John R. Howard, West Chicago, both of Ill., assignors to The Drackett Company, Cincinnati, Ohio
Filed Apr. 29, 1983, Ser. No. 490,067
Term of patent 14 years
U.S. Cl. D32—50



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 3RD DAY OF DECEMBER, 1985

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. H. Robins Company, Incorporated: *See*—
Taylor, Chandler R., Jr., 4,556,667, Cl. 514-352.000.

A. O. Smith Corp.: *See*—
Pflederer, Fred R., 4,556,204, Cl. 267-148.000.

AB Mecman: *See*—
Hoglund, Ingolf, 4,555,980, Cl. 92-88.000.

Abe, Masao: *See*—
Tamura, Shohei; Sasaki, Sadamitsu; Sasaki, Takeshi; Ichinose, Hisashi; Nakamoto, Keiji; Abe, Masao; and Nakazawa, Hitoshi, 4,556,623, Cl. 430-83.000.

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Abe, Shuji; Abe, Tatsumi; and Sakamoto, Fumimaro, to Abeseiki Co., Ltd. Press for adjusting and inspecting molds. 4,556,380, Cl. 425-188.000.

Abe, Tatsumi: *See*—
Abe, Shuji; Abe, Tatsumi; and Sakamoto, Fumimaro, 4,556,380, Cl. 425-188.000.

Abele, Anton: *See*—
Bihler, Franz; and Abele, Anton, 4,556,229, Cl. 280-5.220.

Aberg, Gunnar A. K.; Maroko, Peter R.; and af Ekenstam, Bo T., to Aberg, Gunnar A. K. Method and composition for the treatment of cardiac arrhythmias. 4,556,664, Cl. 514-330.000.

Abernathey, John R.; and Koburger, Charles W., III, to International Business Machines Corporation. Vertically isolated complementary transistors. 4,556,585, Cl. 427-85.000.

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Adamson, Howard, Jr. Spring operated tracheotome. 4,556,059, Cl. 128-305.300.

Addamiano, Arrigo, to United States of America, Navy. Method of preparing single crystalline cubic silicon carbide layers. 4,556,436, Cl. 148-175.000.

Adragem Limited: *See*—
Copson, Alexander G., 4,556,008, Cl. 114-265.000.

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Wiesehahn, Gary P.; Giles, Richard E.; and Stevens, David R., 4,556,556, Cl. 424-89.000.

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Aberg, Gunnar A. K.; Maroko, Peter R.; and af Ekenstam, Bo T., 4,556,664, Cl. 514-330.000.

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Poulsen, Bo, 4,556,091, Cl. 141-82.000.

Agata, Akihiko, to Shin-Ei Kabushiki Kaisha. Steam boiler. 4,556,018, Cl. 122-35.000.

Agence Spatiale Europeenne: *See*—
Bentall, Richard H.; and Briscoe, Henry M., 4,556,182, Cl. 248-179.000.

Agencie Nationale de Valorisation de la Recherche: *See*—
Armand, Michel B.; and El Kadiri Cherkaoui el Moursli, Fouzia, 4,556,616, Cl. 429-192.000.

AGFA-Gevaert A.G.: *See*—
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Paau, Alan; Platt, Steven G.; and Sequeira, Luis, 4,556,643, Cl. 436-501.000.

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Ahlbrandt, Andreas. Retract mechanism for corona treater station. 4,556,544, Cl. 422-186.040.

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Burgoyne, William F., Jr.; Chen, Michael S.; Dixon, Dale D.; and Edwards, Thomas J., 4,556,546, Cl. 423-226.000.
Shenoy, Thirthahalli A.; and Losin, Martha S., 4,556,404, Cl. 62-17.000.
Spector, Marshall L.; Hong, Sun-nan; and Seebohm, Robert P., 4,556,491, Cl. 210-608.000.
Thurber, Scott W., 4,555,839, Cl. 29-450.000.
Wilson, Keith B., 4,556,522, Cl. 261-114.00R.

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Boucher, Stephen G.; and Jeffers, Robert K., 4,555,938, Cl. 73-187.000.

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Woogerd, Stanley M., 4,556,434, Cl. 134-22.140.

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Hyodo, Hitoshi; and Sakakibara, Naoji, 4,556,861, Cl. 340-62.000.

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Hiruma, Teruo; Honma, Atsushi; Hirano, Tooru; Tsuchiya, Yutaka; Hayata, Yoshihiro; Aizawa, Katsuo; Kato, Harubumi; and Kainuma, Keiji, 4,556,057, Cl. 128-303.100.

Akagawa, Masaki; Onda, Hideaki; Kobayashi, Osamu; and Nishiumi, Kenji, to Kabushiki Kaisha Nippon Coinco. Bill accepting device. 4,556,139, Cl. 194-4.00C.

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Maehara, Toshifumi, 4,556,260, Cl. 303-116.000.

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Klug, Lothar; and Schmuck, Klaus, 4,555,900, Cl. 57-355.000.

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Yamawaki, Satoshi; Sugihara, Atsushi; Kobayashi, Yasushi; Ishida, Hiroshi; Kuramasu, Yukio; and Gotoh, Ichisei, 4,556,165, Cl. 228-223.000.

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Aleksoff, Carl C.: *See*—
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Allied Colloids Limited: *See*—
Farrar, David; and Benn, Gerald P., 4,556,728, Cl. 560-217.000.

Allied Corporation: *See*—
Barnes, Ramon M.; and Fodor, Peter, 4,556,318, Cl. 356-316.000.
Briones, Francisco R., 4,556,272, Cl. 339-99.00R.
Iadarola, Ralph E., 4,556,759, Cl. 174-68.500.
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Pauwels, Michael A.; Wright, Danny O.; and Harvey, Bruce J., 4,556,943, Cl. 364-431.120.
Peyton, Richard H., 4,556,077, Cl. 137-112.000.
Pujari, Vimal K., 4,556,090, Cl. 141-59.000.
Russo, Frank A.; Pauwels, Michael A.; and Bauer, Thomas A., 4,556,942, Cl. 364-431.070.
Schutzle, Gunter; and Reichardt, Manfred, 4,556,270, Cl. 339-91.00R.
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Stewart, Donald F.; Tubridy, Michael F.; and Huthwaite, Herbert J., 4,556,696, Cl. 525-432.000.
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Bowman, Kenneth A.; Jacoby, John E.; and Finn, Kellen M., 4,556,535, Cl. 420-580.000.
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Fu, Yun-Lung; and Wang, Samuel S., 4,556,483, Cl. 209-166.000.
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Sugiyama, Takahiro, 4,556,296, Cl. 350-475.000.
Urata, Shinji; Aoyagi, Shigehiko; and Yamazaki, Kazuhiro, 4,556,907, Cl. 358-210.000.

Asahi, Yoshio: *See*—
Maki, Takao; Masuyama, Tetsuo; and Asahi, Yoshio, 4,556,751, Cl. 585-481.000.

Asano, Masamichi: *See*—
Iwahashi, Hiroshi; and Asano, Masamichi, 4,556,961, Cl. 365-194.000.

Asano, Toru: *See*—
Yoshikawa, Kazuo; Yamaguchi, Hisashi; and Asano, Toru, 4,556,871, Cl. 340-365.00C.

Ashland Oil, Inc.: *See*—
Benslay, Roger M., 4,556,540, Cl. 422-142.000.

Aspiotis, Evgeny K.; Vitjuk, Boris Y.; Malakhov, Evgeny I.; Danshin, Boris V.; Sokolov, Vladimir A.; Sidorov, Anatoly S.; and Volkov, Leonid V., to Vsesojuzny Nauchno-Issledovatelsky Institut Maslichnykh Kultur Imeni V.S. Pustovoita. Method of quantitative analysis of substances and nuclear-resonant quantitative analyzer therefor. 4,556,847, Cl. 324-307.000.

Associated Medical Systems, Inc.: *See*—
Morin, Marius J.; and Munro, Jack C., 4,556,074, Cl. 132-92.00R.

Aszlanyi, Jozsef: *See*—
Hegedus, Bela; Balint, Sandor; Hudak, Janos; Barta, Gyorgy; and Aszlanyi, Jozsef, 4,555,858, Cl. 34-25.000.

AT&T Bell Laboratories: *See*—
Carlson, Eric R., 4,556,841, Cl. 324-73.00R.
Chan, Dominic K.; Lee, Kwok P.; and Martin, Ronald B., 4,556,972, Cl. 370-60.000.
Curtis, Hazen, III, 4,556,276, Cl. 339-258.00R.
Glass, Alastair M.; and Liao, Paul F., 4,556,790, Cl. 250-211.00J.
Levinstein, Hyman J.; and Vaidya, Sheila, 4,555,842, Cl. 29-571.000.
Stone, Julian, 4,556,314, Cl. 356-73.100.
Thomson, David J., 4,556,869, Cl. 340-347.0DD.

AT&T Technoligies, Inc.: *See*—
Blitchington, Frank H.; and Haught, David E., 4,556,903, Cl. 358-106.000.

AT&T Technologies, Inc.: *See*—
Bahnck, Norman; and Kloap, Philip, 4,556,362, Cl. 414-744.00B.
Kim, Byoung S., 4,555,954, Cl. 73-862.040.

AT&T Teletype Corporation: *See*—
Kirpiuk, Kenneth R.; and Lewinski, Kenneth F., 4,556,189, Cl. 248-649.000.

Ataka, Saburo: *See*—
Imamura, Yoshinori; Ataka, Saburo; Takasaki, Yukio; Tanaka, Yasuo; Hirai, Tadaaki; and Maruyama, Eiichi, 4,556,816, Cl. 313-366.000.

Atlantic Richfield Company: *See*—
Dean, Barry D., 4,556,512, Cl. 260-239.0BC.
Hazbun, Edward A., 4,556,749, Cl. 585-330.000.
Miller, Richard F.; and Nicholson, Michael P., 4,556,476, Cl. 208-48.0AA.

Atsumi, Haruo; Iwakiri, Norio; Kiyono, Yasuhiro; and Hayakawa, Tomohiko, to Omron Tateisi Electronics Co. Limit switch assembly. 4,556,768, Cl. 200-302.200.

Atsumi, Kinya: *See*—
Atsumi, Morihiro; Yoshida, Hitoshi; Ito, Nobuei; and Atsumi, Kinya, 4,556,780, Cl. 219-270.000.

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Auto-Tint, Inc.: *See*—
Tarr, Henry, 4,556,011, Cl. 118-46.000.

Autocoussin: *See*—
Remy, Michel N.; Delaite, Jean-Francois; and Woirgard, Guy J., 4,555,924, Cl. 72-307.000.

Avery International Corporation: *See*—
Moya, Edward J., 4,556,443, Cl. 156-356.000.

Awalt, Thomas Y., Jr., to Deep Seven Co. Anchor boom assembly. 4,556,007, Cl. 114-210.000.

Ayers, Ray R., to Shell Oil Company. Work platform. 4,556,341, Cl. 405-195.000.

Azuma, Chiaki: *See*—
Ogata, Naoya; Sanui, Kohei; Azuma, Chiaki; Tanaka, Hozumi; Oguchi, Kiyoshi; Takahashi, Yoichi; and Nakada, Tomihiro, 4,556,619, Cl. 430-17.000.

Baba, Nobuyuki: *See*—
Matsushita, Susumu; Tada, Yoshimitsu; Ikushige, Tetsuo; and Baba, Nobuyuki, 4,556,538, Cl. 422-70.000.

Babcock & Wilcox Company, The: *See*—
Gwin, Richard B.; and Manning, Philip H., 4,556,162, Cl. 228-50.000.

Bachner, Frank J.: *See*—
Fan, John C. C.; and Bachner, Frank J., 4,556,277, Cl. 350-1.700.

Bagby, Robert J., to United States Riley Corporation. Single cable optical fibre signaling system. 4,556,280, Cl. 350-96.160.

Bahnck, Norman; and Kloap, Philip, to AT&T Technologies, Inc. Methods of and apparatus for handling semiconductor devices. 4,556,362, Cl. 414-744.00B.

Baigas, Joseph F., Jr., to Hobbs Bonded Fibers. Evaporative cooler with high loft cooler pad. 4,556,521, Cl. 261-94.000.

Baird, Denzil B.: *See*—
Dansie, Ryan F.; Holmes, Wendell; and Baird, Denzil B., 4,556,199, Cl. 254-348.000.

Baji, Toru: *See*—
Ohta, Hisao; Baji, Toru; Izawa, Yuji; Ebisui, Eizou; Tsukada, Toshihisa; and Yamamoto, Hideaki, 4,556,800, Cl. 250-578.000.

Bajtala, Ladislav; and Puskin, Pavel, to System-Finanz Anlagenberatungsgesellschaft m.b.H., by said Ladislav Bajtala. Cigarette dispenser with electric starter. 4,556,154, Cl. 221-147.000.

Baker, Ira R.: *See*—
Barreras, Francisco J.; and Baker, Ira R., 4,556,061, Cl. 128-419.0PT.

Baker, Malcolm J.: *See*—
Stiff, Rodney A.; Baker, Malcolm J.; and Lester, Leslie J., 4,555,896, Cl. 56-13.900.

Baldenko, Dmitry F.; Vadetsky, Jury V.; Goldobin, Vladimir B.; Gusman, Moisei T.; Kochnev, Anatoly M.; Nikomarov, Samuil S.; and Semenets, Valery I., to Vsesojuzny Nauchnousledovatelsky Institut Burovoi Tekhniki. Hinge joint for a screw planetary hydraulic drill. 4,556,398, Cl. 464-16.000.

Balint, Sandor: *See*—
Hegedus, Bela; Balint, Sandor; Hudak, Janos; Barta, Gyorgy; and Aszlanyi, Jozsef, 4,555,858, Cl. 34-25.000.

Bandurco, Victor T.: *See*—
Kanojia, Ramesh M.; Bandurco, Victor T.; Levine, Seymour D.; Mulvey, Dennis M.; and Tobia, Alfonso J., 4,556,739, Cl. 564-443.000.

Bannink, Engbert T., Jr., to Boeing Company, The. Method of sealing and bonding laminated epoxy plates. 4,556,439, Cl. 156-92.000.

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Bannink, Engbert T., Jr., to Boeing Company, The. Conductive joint seals for composite aircraft. 4,556,592, Cl. 428-43.000.

Bannister, Dennis J., to United Kingdom Atomic Energy Authority. Solid state electrochemical cell. 4,556,615, Cl. 429-192.000.

Barish, Herman B., to Lockheed Corporation. Split-point twist drill. 4,556,347, Cl. 408-230.000.

Barker, Michael D., to D. Wickham and Company Limited. Centrifugal pumps. 4,556,364, Cl. 415-170.00A.

Barlow, Joel H.; and Michaels, Michael. Paint machine and method of operation. 4,556,586, Cl. 427-282.000.

Barnes, Ramon M.; and Fodor, Peter, to Allied Corporation. Spectrochemical analysis. 4,556,318, Cl. 356-316.000.

Baron, Klaus U.: *See*—
Kranz, Jakob; Kaiser, Joachim; Wiegemann, Hans-Bertram; and Baron, Klaus U., 4,556,320, Cl. 356-350.000.

Barrera, Ricardo: *See*—
Riffel, Leonard F.; and Barrera, Ricardo, 4,556,046, Cl. 126-299.00D.

Barreras, Francisco J.; and Baker, Ira R., to Cordis Corporation. Cardiac pacer with battery consumption monitor circuit. 4,556,061, Cl. 128-419.0PT.

Barron, David J. Elevated court game apparatus. 4,556,218, Cl. 273-30.000.

Barsness, Gerald H.; and Kleine, Richard A. Wood and coal burning stove. 4,556,044, Cl. 126-77.000.

Barta, Gyorgy: *See*—
Hegedus, Bela; Balint, Sandor; Hudak, Janos; Barta, Gyorgy; and Aszlanyi, Jozsef, 4,555,858, Cl. 34-25.000.

Bartesch, Helmut; and Florin, Gerd, to Escher Wyss Limited. Method for treating soybeans. 4,556,573, Cl. 426-467.000.

Bartlett, Allen J., to Helix Technology Corporation. Cryopump with improved second stage array. 4,555,907, Cl. 62-55.500.

Bartlett, Donald S.; Boback, John A.; and Powell, Thomas M., to GMFanuc Robotics Corporation. Opener apparatus and system utilizing same. 4,556,361, Cl. 414-744.00A.

Barton Mines Corporation, Inc.: *See*—
Schulz, Frank C., Jr., 4,556,297, Cl. 350-529.000.

BASF Aktiengesellschaft: *See*—
Binnig, Fritz; Mueller, Claus D.; Raschack, Manfred; and von Philipsborn, Gerda, 4,556,662, Cl. 514-300.000.
Hoffmann, Gerhard; and Neumann, Peter, 4,556,621, Cl. 430-49.000.
Neumann, Peter; Etzbach, Karl-Heinz; and Hoffmann, Gerhard, 4,556,622, Cl. 430-58.000.

BASF Wyandotte Corporation: *See*—
Braemer, Mark C., 4,556,680, Cl. 521-57.000.

Basile, Philip C., to RCA Corporation. Active, bi-directional bus tap. 4,556,881, Cl. 340-825.000.

Batts, John H.: *See*—
Blanchard, Russell O.; and Batts, John H., 4,556,158, Cl. 223-88.000.

Bauer, Paul, to Beru-Werk, Albert Ruprecht, GmbH & Co. KG, Firma. Self-regulating electric glow plug. 4,556,781, Cl. 219-270.000.

Bauer, Thomas A.: *See*—
Russo, Frank A.; Pauwels, Michael A.; and Bauer, Thomas A., 4,556,942, Cl. 364-431.070.

Baum, Jonathan S.; and Chen, Tsong M., to FMC Corporation. Benzothiazole derivatives for plant growth and development modification. 4,556,411, Cl. 71-90.000.

Baumeister, Peter: *See*—
Wetter, Hansjurg; Baumeister, Peter; Radimerski, Paul; and Martin, Pierre, 4,556,717, Cl. 548-262.000.

Baumoel, Joseph. Cast metal sonic transducer housing. 4,556,813, Cl. 310-334.000.

Bayer Aktiengesellschaft: *See*—
Grohe, Klaus; Petersen, Uwe; Zeiler, Hans-Joachim; and Metzger, Karl G., 4,556,658, Cl. 514-254.000.
Grohe, Klaus; Zeiler, Hans-Joachim; and Metzger, Karl G., 4,556,709, Cl. 544-117.000.
Henk, Hermann, 4,556,707, Cl. 534-635.000.
Minz, Franz-Rudolf; and Vajna, Sandor, 4,556,463, Cl. 204-98.000.
Salzburg, Herbert; Fauss, Rudolf; Findeisen, Kurt; and Homeyer, Bernhard, 4,556,649, Cl. 514-63.000.
Weitz, Robert; Neeff, Rutger; and Hugl, Herbert, 4,556,401, Cl. 8-641.000.

Bayerische Motoren Werke AG: *See*—
Melzer, Hans-Harald; and Spindebock, Wolf-Dieter, 4,555,904, Cl. 60-605.000.

Bayerische Motoren Werke Aktiengesellschaft: *See*—
Matschinsky, Wolfgang, 4,556,238, Cl. 280-701.000.

Bayha, Kurt; and Weyl, Helmut, to Robert Bosch GmbH. Electrochemical gas sensor probe construction. 4,556,475, Cl. 204-427.000.

BBC Brown, Boveri & Company, Ltd.: *See*—
Egli, Walter; Ragaller, Klaus; Schade, Ekkehard; and Stelzer, Roland, 4,556,767, Cl. 200-148.00A.
Ramisch, Jan, 4,556,192, Cl. 251-58.000.

Becker, Klaus, to Linder GmbH Fabrik Elektrischer Lampen und Apparate. Fusible circuit breaker. 4,556,874, Cl. 340-638.000.

Beckway, Bruce C.: *See*—
Fox, James D.; Beckway, Bruce C.; and DeGroot, Robert H., 4,556,167, Cl. 229-45.00R.

Becton, Dickinson and Company: *See*—
Johnson, Michael D., 4,555,813, Cl. 2-161.00R.

Beecham Group p.l.c.: *See*—
Cole, Martin; Howarth, Thomas T.; and Reading, Christopher, 4,556,559, Cl. 424-114.000.

Beisse, Achim; Harer, Helmut; Mohr, Adolf; and Schustek, Siegfried, to Robert Bosch GmbH. Combination synchronous and asynchronous electric motor. 4,556,809, Cl. 310-114.000.

Belknap, Alfred R.: *See*—
Landoll, Donald R.; Kongs, David J.; and Belknap, Alfred R., 4,556,357, Cl. 414-469.000.

Bell, Alexis D., to Mallinckrodt, Inc. Salt substitute containing potassium chloride coated with a mixture of maltodextrin and sodium chloride and method of preparation. 4,556,566, Cl. 426-96.000.

Bell Helmets Inc.: *See*—
Broersma, Lester V., 4,555,816, Cl. 2-425.000.

Bell & Howell Company: *See*—
Stefansson, Rafn, 4,556,333, Cl. 400-58.000.

Bellezza, Gianfranco, to C.P.M. S.p.A. Impianti Industriali. Guardhouse of improved type. 4,555,991, Cl. 109-9.000.

Belly, Robert T.; and Clements, Laurie J., to Eastman Kodak Company. Composition, analytical element and method for the detection of bacteria. 4,556,636, Cl. 435-34.000.

Beloit Corporation: *See*—
Ely, Donald A., 4,556,451, Cl. 162-205.000.

Bender, Franz; Blumensaat, Klaus; and Burthel, Wolfgang, to Daimler-Benz Aktiengesellschaft. Pneumatic control system. 4,556,170, Cl. 236-86.000.

Bender, Fredric G.: *See*—
Swartz, William E.; Everson, Charles W.; and Bender, Fredric G., 4,556,571, Cl. 426-265.000.

Bendure, Raymond L.: *See*—
Swanson, James L.; and Bendure, Raymond L., 4,556,146, Cl. 206-440.000.

Benharkate, Marguerite M.: *See*—
Maillard, Jacques G.; Van, Tri V.; Legeai, Jacky M.; and Benharkate, Marguerite M., 4,556,674, Cl. 514-426.000.

Benn, Gerald P.: *See*—
Farrar, David; and Benn, Gerald P., 4,556,728, Cl. 560-217.000.

Bennett, Robert M.: *See*—
Thompson, David L.; Bennett, Robert M.; and Roline, Glenn M., 4,556,063, Cl. 128-419.0PT.

Benslay, Roger M., to Ashland Oil, Inc. Separation of regenerated catalyst from combustion products. 4,556,540, Cl. 422-142.000.

Benson, Michael R.; and Hill, William D., to General Electric Company. Resistor temperature device trip unit. 4,556,329, Cl. 374-173.000.

Bentall, Richard H.; and Briscoe, Henry M., to Agence Spatiale Europeenne. Device for the orientation and the positioning of a useful load. 4,556,182, Cl. 248-179.000.

Bergevin, Benoit: *See*—
Jean, Benoit; Bergevin, Benoit; and Rheault, Fernand, 4,556,368, Cl. 417-208.000.

Berglund, Hans A. L., to Boliden Aktiebolag. Method for producing granulate sodium tripolyphosphate of low bulk density. 4,556,525, Cl. 264-8.000.

Bergman, Clark; Vergason, Gary E.; Allen, William; and Reed, Michael F., to Multi-Arc Vacuum Systems Inc. Physical vapor deposition apparatus. 4,556,471, Cl. 204-298.000.

Bernhardt, Frederick W.; and Schott, John E. Mine roof anchor bolt. 4,556,350, Cl. 411-10.000.

Berstermann, Wilhelm, to Klockner-Werke Aktiengesellschaft. Process and apparatus for the emission-spectroscopical testing of metallic samples. 4,556,315, Cl. 356-313.000.

Berthet, Pierre: *See*—
Bricot, Claude; Berthet, Pierre; Mertz, Bruno; and Gerard, Jean-Louis, 4,556,966, Cl. 369-52.000.

Beru-Werk, Albert Ruprecht, GmbH & Co. KG, Firma: *See*—
Bauer, Paul, 4,556,781, Cl. 219-270.000.

Berwind Corporation: *See*—
Fathauer, George H.; and Hood, Charles F., 4,555,941, Cl. 73-304.00C.

Best, John S.; and Bullock, David C., to International Business Machines Corporation. Ion doped servo pattern for magnetic recording disk. 4,556,597, Cl. 428-201.000.

Bethmann, Karl W.: *See*—
Romer, Rudolf; Jaeneke, Christian; Bethmann, Karl W.; and Moll, Manfred, 4,555,971, Cl. 89-1.110.

Bette, Willi: *See*—
Cirkel, Hans-Jurgen; Bette, Willi; and Muller, Reinhard, 4,556,981, Cl. 372-86.000.

Bezman, Richard D., to Chevron Research Company. Manufacture of noble metal/zeolite catalysts. 4,556,646, Cl. 502-66.000.

Bialy, Jan; Penczek, Irena; Maczenski, Stanislaw; and Borensztajn, Marek, to Enichimica S.p.A. Process for the production of polyphenylene oxide. 4,556,699, Cl. 526-68.000.

Bieli-Moschlin, Ruedi; and Hurschler-Flury, Alois. Equipment for the repair of, in particular for correcting dents or bulges in, containers. 4,555,926, Cl. 72-392.000.

Bihler, Franz; and Abele, Anton, to Kleindienst GmbH. Stair-climbing apparatus for wheelchair. 4,556,229, Cl. 280-5.220.

Billet, Maurice; and Lallement, Serge, to Compagnie des Produits Industriels de l'Ouest. Protective bellows, particularly for the front wheel drive of a motor vehicle. 4,556,399, Cl. 464-175.000.

Binnig, Fritz; Mueller, Claus D.; Raschack, Manfred; and von Philipsborn, Gerda, to BASF Aktiengesellschaft. Bispidine derivatives and antiarrhythmic compositions. 4,556,662, Cl. 514-300.000.

Bio-Support Industries Limited: *See*—
Roberts, Frank L., 4,556,254, Cl. 297-460.000.

Birmingham Bolt Company: *See*—
White, Claude C., 4,556,344, Cl. 405-261.000.

Bisbing, Robert H., to Southco, Inc. Latch assembly having pull-up action. 4,556,244, Cl. 292-65.000.

Black, Alan J.: *See*—
Mauleon, Jean-Louis; Newman, Robert J.; and Black, Alan J., 4,556,479, Cl. 208-164.000.

Blackburn, Louis W.: *See*—
McCammon, Patrick R.; Blackburn, Louis W.; and Hershberger, Bernard J., 4,556,772, Cl. 219-10.55F.

Blackmore, Eunice S.; Peterson, Gordon C.; and Tiddy, Gordon J. T., to Lever Brothers Company. Liquid fabric-softening composition. 4,556,502, Cl. 252-8.800.

Blanchard, Russell O.; and Batts, John H., to John Thomas Batts, Inc. Parallel bar hanger with compression hinge. 4,556,158, Cl. 223-88.000.

Blanco, Guillermo L.: *See*—
Sodervall, Marja-Liisa; Kurkela, Kauko O. A.; Karjalainen, Arto J.; Toivola, Reijo J.; Kangas, Lauri V. M.; and Blanco, Guillermo L., 4,556,677, Cl. 514-651.000.

Blankenfeld, Heinz: *See*—
Albersdoerfer, Otto; Blankenfeld, Heinz; Kranz, Wolfgang; and Weckwerth, Wolfgang, 4,556,284, Cl. 350-174.000.

Blazer International Corp.: *See*—
Lemme, Charles D.; and Lemme, Tracy R., 4,556,934, Cl. 362-279.000.
Lemme, Charles D., 4,556,935, Cl. 362-279.000.

Blechschmid, John; Coyne, Richard D.; Palmer, David; and Piatt, John A., to GCA Corporation. Apparatus for vapor sheathed baking of semiconductor wafers. 4,556,785, Cl. 219-460.000.

Blitchington, Frank H.; and Haught, David E., to AT&T Technoligies, Inc. Inspection scanning system. 4,556,903, Cl. 358-106.000.

Bloch, Peter; Schneider, Otto; and Donner, Meinrad, to Maag Gear-Wheel & Machine Company Limited. Method and apparatus for eliminating undulation errors on gear-tooth flanks in production gear-fabricating machines. 4,555,871, Cl. 51-52.00R.

Bloom, Terry R.; and Nespor, John F., to CTS Corporation. Porcelain tape for producing porcelainized metal substrates. 4,556,598, Cl. 428-209.000.

Blue Circle Industries plc: *See*—
Hepher, Nicholas M., 4,556,481, Cl. 209-127.000.

Blumensaat, Klaus: *See*—
Bender, Franz; Blumensaat, Klaus; and Burthel, Wolfgang, 4,556,170, Cl. 236-86.000.

Bluthe, Norbert; Falou, Armand S.; and Gore, Jacques, to Rhone-Poulenc Sante. Process for the preparation of α,δ-diethylenic carbonyl compounds. 4,556,742, Cl. 568-403.000.

Board of Governors for Higher Education, State of RI: *See*—
Langdon, Christopher, 4,556,472, Cl. 204-406.000.

Boback, John A.: *See*—
Bartlett, Donald S.; Boback, John A.; and Powell, Thomas M., 4,556,361, Cl. 414-744.00A.

Bochinski, Rolf; Eimer, Klaus; Lange, Alois; and Nghiem, Xuan L., to Taprogge Gesellschaft mbH. Batch-type scrubbing-ball replacement system for heat exchanger. 4,556,102, Cl. 165-95.000.

Boden, Richard M.: *See*—
Fujioka, Futoshi; Boden, Richard M.; and Schreiber, William L., 4,556,746, Cl. 568-648.000.

Boehm, James A., III: *See*—
Dalton, Leslie W., Jr.; Boehm, James A., III; and Cooper, William K., 4,556,069, Cl. 128-746.000.

Boeing Company, The: *See*—
Bannink, Engbert T., Jr., 4,556,439, Cl. 156-92.000.
Bannink, Engbert T., Jr., 4,556,591, Cl. 428-43.000.
Bannink, Engbert T., Jr., 4,556,592, Cl. 428-43.000.
Buehler, Walter E., 4,556,889, Cl. 343-707.000.

Bogacki, Anthony P.: *See*—
Milkovic, Miran; and Bogacki, Anthony P., 4,556,843, Cl. 324-107.000.

Bogdanovic, Borislav: *See*—
Bonnemann, Helmut; and Bogdanovic, Borislav, 4,556,719, Cl. 556-13.000.

Bogosh, Donald. Air handling system. 4,555,912, Cl. 62-272.000.

Bogren, Ingemar S. B., to Esselte Pac Aktiebolag. Tear opening means for containers. 4,556,152, Cl. 220-276.000.

Bohm, Roland: *See*—
Heier, Karl H.; Bohm, Roland; and Hobes, John V., 4,556,499, Cl. 252-51.50A.

Bohrer, Philip J.; Higashi, Robert E.; Johnson, Timothy L.; and Satren, Ernest A., to Honeywell Inc. Condition responsive sensor for fluid flow measurement. 4,555,939, Cl. 73-198.000.

Bojkov, Dimiter K.: *See*—
Lyutzkanov, Stoyan S.; and Bojkov, Dimiter K., 4,555,995, Cl. 110-335.000.

Boliden Aktiebolag: *See*—
Berglund, Hans A. L., 4,556,525, Cl. 264-8.000.
Ludvigsson, Bjorn M., 4,555,942, Cl. 73-433.000.

Bolin, Philip C.; Bowman, Gary K.; Ellis, Charles S.; Hopkins, Melvyn D.; and Kane, Richard E., to Westinghouse Electric Corp. Insulating spacer design for a modular gas-insulated transmission line. 4,556,755, Cl. 174-21.00C.

Bolli, Peter, to Interlego AG. Toy building block with electrical contacts. 4,556,393, Cl. 446-91.000.

Bollinger, Wayne C.: *See*—
Burnett, Arthur P.; and Bollinger, Wayne C., 4,556,534, Cl. 420-445.000.

Bolte, Steven B.: *See*—
Gruber, Robert J.; Koch, Ronald J.; Knapp, John F.; and Bolte, Steven B., 4,556,624, Cl. 430-110.000.

Bolton, Theodore S.; and Lang, Richard D., to Carrier Corporation. Apparatus for securing and sealing a packaged terminal air conditioner to a plastic wall sleeve. 4,555,983, Cl. 98-114.000.

Boner, Alan H. Parallel heat exchanger with interlocking plate arrangement. 4,556,105, Cl. 165-165.000.

Bonnemann, Helmut; and Bogdanovic, Borislav, to Studiengesellschaft Kohle MBH. Production of transition metal complexes. 4,556,719, Cl. 556-13.000.

Bonner, Francis J., Jr. Cold compress. 4,556,055, Cl. 128-82.100.

Bordet, Rene ; Grovalet, Yves; Caudron, Lionel; and Diver, Marius, to Service National Electricite de France. Stack, particularly atmospheric cooling tower. 4,555,881, Cl. 52-167.000.

Borensztajn, Marek: *See*—
Bialy, Jan; Penczek, Irena; Maczenski, Stanislaw; and Borensztajn, Marek, 4,556,699, Cl. 526-68.000.

Borg-Warner Corporation: *See*—
Jenkins, Patrick A., 4,555,952, Cl. 73-861.470.
Lech, Thaddeus, Jr., 4,556,136, Cl. 192-106.200.
Sturges, Fred D., 4,555,910, Cl. 62-184.000.

Borland, Wayne R. Backgammon board game for three players. 4,556,221, Cl. 273-248.000.

Boross, Laszlo ; Szajani, Bela; and Kovacs, Kamilla, to Reanal Finomvegyszergyar. Immobilized cholinesterase enzyme preparations and a process for the preparation thereof. 4,556,637, Cl. 435-181.000.

Boryung Pharmaceutical Co., Ltd.: *See*—
Kim, Don K., 4,556,516, Cl. 260-239.100.

Boucher, Stephen G.; and Jeffers, Robert K., to Airmar Technology Corporation. Marine instrument. 4,555,938, Cl. 73-187.000.

Bouffard, Ivan. Snare trap. 4,555,863, Cl. 43-87.000.

Bourgeois, Michel: *See*—
Wattiez, Daniel; Chatelin, Roger; and Bourgeois, Michel, 4,556,721, Cl. 556-128.000.

Bowman, Gary K.: *See*—
Bolin, Philip C.; Bowman, Gary K.; Ellis, Charles S.; Hopkins, Melvyn D.; and Kane, Richard E., 4,556,755, Cl. 174-21.00C.

Bowman, Kenneth A.; Jacoby, John E.; and Finn, Kellen M., to Aluminum Company of America. Production of aluminum-lithium alloy by continuous addition of lithium to molten aluminum stream. 4,556,535, Cl. 420-580.000.

Bozsoky, Sandor: *See*—
Pongor nee Csakvari, Marianna; Nagy, Gabor; Horvath, Gabor; David nee Kenez, Maria; Bozsoky, Sandor; Virag, Sandor; and Marmarosi nee Kellner, Katalin, 4,556,563, Cl. 514-258.000.

BP Chemicals Limited: *See*—
Lawrenson, Malcolm J., 4,556,741, Cl. 568-395.000.

Braat, Josephus J. M., to U.S. Philips Corporation. Record carrier having an optically readable information structure comprised of information areas of two different phase depths. 4,556,967, Cl. 369-275.000.

Bracoud, Corinne: *See*—
Chastrette, Francine; Bracoud, Corinne; and Chastrette, Maurice, 4,556,718, Cl. 549-449.000.

Bradley, Albert J.; and Lake, Barrie D. Adhesive applicators. 4,556,447, Cl. 156-578.000.

Braemer, Mark C., to BASF Wyandotte Corporation. Method of producing antistatic expandable polystyrene products. 4,556,680, Cl. 521-57.000.

Braksmayer, Diza P., to FMC Corporation. Flame retardant thermoplastic polycarbonate polymers. 4,556,698, Cl. 525-469.000.

Brander, Rita W.; Raap, Teresa A.; and Gessler, Joseph F., to General Foods Corporation. Soy milk containing cheese analog. 4,556,569, Cl. 426-104.000.

Brander, Rita W.; Raap, Teresa A.; and Rankowitz, Marshall M., to General Foods Corporation. Vienna sausage meat analog. 4,556,570, Cl. 426-104.000.

Branton, Tom W.: *See*—
VanBreemen, Bertram; Wilson, William L.; Roberts, Duane L.; and Branton, Tom W., 4,556,913, Cl. 358-237.000.

Brasseur, Georg, to Friedmann & Maier Aktiengesellschaft. Electronic switch. 4,556,838, Cl. 323-285.000.

Bratton, Ronald E., to Lincoln Manufacturing Company, Inc. Air delivery system for an impingement food preparation oven including a conical air deflector. 4,556,043, Cl. 126-21.00A.

Braun, Anton. Bellows seal. 4,556,369, Cl. 417-437.000.

Braun, Eugene R., to Eaton Corporation. Shift control system. 4,555,959, Cl. 74-334.000.

Braun, Jane E.: *See*—
Rahn, Melanie H.; and Braun, Jane E., 4,556,390, Cl. 434-433.000.

Brazel, Jens. Hand device for determining vehicle position. 4,555,852, Cl. 33-27.00B.

Brenner, Robert A.; and Sherer, Robert B., to Whirlpool Corporation. Flexible vane agitator for high stroke rate automatic washer. 4,555,919, Cl. 68-134.000.

Bresson, Clarence R.; and Parlman, Robert M., to Phillips Petroleum Company. Flotation reagents. 4,556,500, Cl. 252-61.000.

Brewer, James A.; Eggebrecht, Lewis C.; Kummer, David A.; and McHugh, Patricia P., to International Business Machines Corporation. Refresh circuit for dynamic memory of a data processor employing a direct memory access controller. 4,556,952, Cl. 364-900.000.

Bricot, Claude; Berthet, Pierre; Mertz, Bruno; and Gerard, Jean-Louis, to Thomson-CSF. Information carrier disk with angular coding means and a system for driving said disk in rotation. 4,556,966, Cl. 369-52.000.

Bridges, Charles D., to Gray Tool Comany. Fire resistant valve. 4,556,076, Cl. 137-72.000.

Brifman, Josef; Chacon, M. Frank; Schmerda, Richard F.; and Smith, Frank E., to Eaton Corporation. Remote control circuit breaker system with on-off-tripped-problem status storage and indication. 4,556,882, Cl. 340-825.060.

Briones, Francisco R., to Allied Corporation. Flat cable connector. 4,556,272, Cl. 339-99.00R.

Briscoe, Henry M.: *See*—
Bentall, Richard H.; and Briscoe, Henry M., 4,556,182, Cl. 248-179.000.

Britax Vega Limited: *See*—
Tysoe, Nicholas W., 4,556,928, Cl. 362-268.000.

British Petroleum Company p.l.c., The: *See*—
Griggs, Colin G.; and Lodge, Philip G., 4,556,744, Cl. 568-487.000.

British Telecommunications: *See*—
Smith, David W.; and Wyatt, Richard, 4,556,980, Cl. 372-28.000.

Broersma, Lester V., to Bell Helmets Inc. Ventilated helmet. 4,555,816, Cl. 2-425.000.

Brokaw, Adrian P.; and Maidique, Modesto A., to Analog Devices, Incorporated. A-To-d converter of the successive-approximation type. 4,556,870, Cl. 340-347.0AD.

Broney, Scott C.: *See*—
Chesney, Joseph J., Jr.; Broney, Scott C.; and Ely, George A., 4,556,426, Cl. 106-18.320.

Brown, Boveri & Cie AG: *See*—
Mennicke, Stefan; and Reiss, Karl, 4,555,846, Cl. 29-623.500.
Strietzel, Rainer, 4,556,883, Cl. 340-825.540.

Brown, Dewey E. Bow sight. 4,555,856, Cl. 33-265.000.

Brown, Glenn E.: *See*—
Moffitt, Gregory A.; and Brown, Glenn E., 4,555,882, Cl. 52-204.000.

Brown, Glenn W.: *See*—
Gersch, Herbert M.; and Brown, Glenn W., 4,556,528, Cl. 264-221.000.

Brown, Paul P., to Husky Injection Molding Systems Ltd. Self-centering arrangement for coacting forming tools. 4,556,377, Cl. 425-138.000.

Brown, Walter E.; and Chow, Laurence C., to American Dental Association Health Foundation. Compositions and methods for topically fluoridating and/or mineralizing dental tissue. 4,556,561, Cl. 424-151.000.

Brown & Williamson Tobacco Corporation. *See*—
Gravely, Lawrence E.; Geiss, Vernon L.; and Gregory, Charles F., 4,556,073, Cl. 131-297.000.

Brunner, Josef: *See*—
Rock, Erich; and Brunner, Josef, 4,556,205, Cl. 269-2.000.

Brunninger, Manfred: *See*—
Theurer, Josef; and Brunninger, Manfred, 4,556,112, Cl. 171-16.000.

Bruns, Engelbert; and Lucas, August, to Carl Still GmbH & Co. KG, Firma. Sealing arrangement at coke oven chambers. 4,556,459, Cl. 202-263.000.

Bruns, Engelbert: *See*—
Weber, Heinrich; Lorenz, Kurt; Dungs, Horst; Bruns, Engelbert; and Osterholt, Gerd, 4,556,455, Cl. 201-39.000.

BTU Engineering Corporation: *See*—
Sarkozy, Robert F., 4,556,584, Cl. 427-54.100.

Bubb, Howard G.: *See*—
Flanagin, Stephen D.; Bubb, Howard G.; and Scantlin, John R., 4,556,970, Cl. 370-58.000.

Bucarelli, Luciano, to Fiat Trattori S.p.A. Manually-engaged and automatically disengaged locking device for a vehicle differential. 4,555,962, Cl. 74-710.500.

Buckingham, Kent W., to Procter & Gamble Company, The. Methods for the treatment and prophylaxis of diaper rash and diaper dermatitis. 4,556,560, Cl. 424-145.000.

Buddy L Corporation: *See*—
Kennedy, Melvin R.; Nagel, Dietmar; and Arad, Abraham, 4,556,396, Cl. 446-23.000.

Buehler, Walter E., to Boeing Company, The. Aircraft trailing ball antenna. 4,556,889, Cl. 343-707.000.

Bullock, David C.: *See*—
Best, John S.; and Bullock, David C., 4,556,597, Cl. 428-201.000.

Burandt, Wesley A.; and Aldrich, Allyn M., to Sundstrand Corporation. Multiple displacement motor driven power drive unit. 4,555,978, Cl. 91-506.000.

Burgoyne, William F., Jr.; Chen, Michael S.; Dixon, Dale D.; and Edwards, Thomas J., to Air Products and Chemicals, Inc. Bis tertiary amino alkyl derivatives as solvents for acid gas removal from gas streams. 4,556,546, Cl. 423-226.000.

Burlington Industries, Inc.: *See*—
Williams, Franklin E., 4,556,602, Cl. 428-259.000.

Burmeister, Kevin L., to Graphite Sales, Inc. Mold plug and method for sealing an ingot mold. 4,556,097, Cl. 164-137.000.

Burndy Corporation: *See*—
Noschese, Rocco J., 4,556,268, Cl. 339-74.00R.

Burnett, Arthur P.; and Bollinger, Wayne C., to Dentsply Research & Development Corp. Nickel based casting alloy. 4,556,534, Cl. 420-445.000.

Burns, William K.; and Moeller, Robert P., to United States of America, Navy. Broadband unpolarized light source. 4,556,293, Cl. 350-400.000.

Burron Medical Inc.: *See*—
Raines, Kenneth C., 4,556,086, Cl. 137-852.000.

Burroughs Corporation: *See*—
Trethewey, Paul M., 4,556,964, Cl. 369-44.000.

Burroughs Wellcome Co.: *See*—
Copp, Frederick C.; and Eakins, Kenneth E., 4,556,671, Cl. 514-404.000.

Burthel, Wolfgang: *See*—
Bender, Franz; Blumensaat, Klaus; and Burthel, Wolfgang, 4,556,170, Cl. 236-86.000.

Bush, Darrell C.: *See*—
Freeman, David L.; and Bush, Darrell C., 4,555,934, Cl. 73-38.000.

Bustani-Adem, Alberto: *See*—
Martinez-Vera, Enrique R.; and Bustani-Adem, Alberto, 4,556,417, Cl. 75-35.000.

Buzzi, Fabio; and Riganti, Emilio, to Innocente Riganti Officine Meccaniche S.p.A. Process for producing propellers. 4,555,835, Cl. 29-156.80R.

Bytzek, Max: *See*—
Andrae, Klaus; Bytzek, Max; Hutschenreuter, Elfried; and Lang, Hans U., 4,556,708, Cl. 536-57.000.

C.P.M. S.p.A. Impianti Industriali: *See*—
Bellezza, Gianfranco, 4,555,991, Cl. 109-9.000.

Cadiergue, Joseph: *See*—
Tessier, Jean; Demoute, Jean-Pierre; and Cadiergue, Joseph, 4,556,666, Cl. 514-351.000.

CAE Electronics, Ltd.: *See*—
King, Michael, 4,555,960, Cl. 74-471.0XY.

Cahen, Raymond M.: *See*—
Debras, Guy L. G.; De Clippeleir, Georges E. M. J.; and Cahen, Raymond M., 4,556,753, Cl. 585-643.000.

Cahuzac, Georges J. J., to Societe Nationale Industrielle et Aerospatiale. Unitary needle with openable eye. 4,555,918, Cl. 66-119.000.

Cain Encoder Company: *See*—
Wason, Thomas D., 4,556,844, Cl. 324-156.000.

Calkins, Noel C. Force and multiplication control valve. 4,556,195, Cl. 251-129.200.

Calvo, Luis C., to Germaine Monteil Cosmetiques Corp. Immobilized enzymes. 4,556,554, Cl. 424-70.000.

Camco Inc.: *See*—
St. Louis, Robert M., 4,555,827, Cl. 16-34.000.

Cammilli, Leonardo: *See*—
Grassi, Gino; Cammilli, Leonardo; Alcidi, Luciano; and Marconi, Paolo, 4,556,062, Cl. 128-419.0PG.

Campbell, Robert A. Universal adjustable telephone handset holder. 4,556,762, Cl. 179-157.000.

Campbell, Roscoe, to Harris Graphics Corporation. Web skewing apparatus. 4,556,208, Cl. 270-52.000.

Campbell Soup Company: *See*—
Gaehring, David P., 4,556,576, Cl. 426-615.000.

Canadian General Electric Company Limited: *See*—
Schwalm, Charles L.; and Hill, Walter A., 4,556,830, Cl. 318-326.000.
Trussler, Ronald C.; Stevenson, Andrew C.; and Eastcott, Peter D., 4,556,826, Cl. 318-92.000.

Canadian Patents and Development Limited: *See*—
Ziogas, Phiovos D.; and Ranganathan, V. Thathachary T., 4,556,937, Cl. 363-8.000.

Canivet, Jean-Luc, to Les Cables de Lyon. Apparatus for stranding armor wires about a cable core, and method implemented by the apparatus. 4,555,898, Cl. 57-19.000.

Canon Kabushiki Kaisha: *See*—
Maeda, Masaya; and Takei, Masahiro, 4,556,920, Cl. 360-77.000.
Masuda, Shunichi, 4,556,310, Cl. 355-14.00R.
Sekimura, Nobuyuki, 4,556,288, Cl. 350-339.00R.
Shibata, Takehiko; and Yokomizo, Yoshikazu, 4,556,915, Cl. 358-280.000.
Sugiura, Yoji; Yamamoto, Hironori; Nishida, Keijiro; Shirai, Naoki; Takahashi, Kimio; Nakasugi, Mikio; and Saito, Norihisa, 4,556,285, Cl. 350-600.000.
Terasawa, Koji, 4,556,894, Cl. 346-140.00R.

Capaldi, Nicholas R.; and Griffin, Brian W., to Smiths Industries Public Limited Company. Accelerometer. 4,555,946, Cl. 73-517.00B.

Caprio, A. Ronald; Cyr, John P.; Geaghan, Bernard O.; Kotschenreuther, Paul C.; Schanin, David J.; and Salett, Ronald M. Interchangeable interface circuitry arrangements for use with a data processing system. 4,556,953, Cl. 364-900.000.

Carbo, Adelaida; and Good, Raymond H., to American Can Company. Internal lubricant which enables epoxy phenolic exterior coated TFS plate to be triple drawn and ironed. 4,556,498, Cl. 252-51.50R.

Carl Still GmbH & Co. KG, Firma: *See*—
Bruns, Engelbert; and Lucas, August, 4,556,459, Cl. 202-263.000.
Weber, Heinrich; Lorenz, Kurt; Dungs, Horst; Bruns, Engelbert; and Osterholt, Gerd, 4,556,455, Cl. 201-39.000.

Carlson, Eric R., to AT&T Bell Laboratories. Measurement system for characterizing power amplifier and other device performance. 4,556,841, Cl. 324-73.00R.

Carlstedt, Richard A., to Miner Enterprises. Draft gear. 4,556,149, Cl. 213-34.000.

Carr, Neil; and Gray, George W., to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Liquid crystal compounds. 4,556,745, Cl. 568-632.000.

Carr, Roger D., to Savin Corporation. Sheet stacking apparatus and registration mechanism therefor. 4,556,211, Cl. 271-221.000.

Carrier Corporation: *See*—
Bolton, Theodore S.; and Lang, Richard D., 4,555,983, Cl. 98-114.000.
Jackson, Dale E., 4,556,778, Cl. 219-125.110.

Casilli, Joseph C., to ITT Corporation. Pulsation damper. 4,556,087, Cl. 138-30.000.

Castagnos, Leonce F., Jr.: *See*—
Sayles, Scott M.; and Castagnos, Leonce F., Jr., 4,556,542, Cl. 422-147.000.

Castelein, Jean, to Montefina S.A. Thermoplastic rubber consisting of a mixture of polypropylene, high-impact polystyrene and a styrene/diene block copolymer. 4,556,691, Cl. 525-71.000.

Castelli, Renato, to Samsonite Corporation. Tidy element provided with several compartments. 4,556,144, Cl. 206-214.000.

Caudron, Lionel: *See*—
Bordet, Rene ; Grovalet, Yves; Caudron, Lionel; and Diver, Marius, 4,555,881, Cl. 52-167.000.

Cawi, Vernon A.; and Stengle, Barry J., to Phillips Petroleum Company. Removal of topped crude demineralization sediment by backwashing filter to crude oil desalting process. 4,556,480, Cl. 208-211.000.

Cebal: *See*—
Vany, Gerard, 4,556,312, Cl. 355-47.000.

Cedars-Sinai Medical Center: *See*—
Rubinstein, Alan, 4,556,558, Cl. 424-101.000.

Centre Technique Industriel Styled: Institut Textile: *See*—
Wattiez, Daniel; Chatelin, Roger; and Bourgeois, Michel, 4,556,721, Cl. 556-128.000.

Cerim, S.P.A.: *See*—
Pedretti, Gaetano; and Marazzi, Paolo, 4,555,823, Cl. 12-77.000.

Cervinka, Franz. Sand-dispensing device for motor vehicles. 4,556,243, Cl. 291-25.000.

Cetnarowski, Robert. Fluid-powered multiple pistonrod lift unit. 4,555,979, Cl. 92-85.00B.

Cetus Corporation: *See*—
Frankel, Arthur E.; Johnson, Larry J.; and Wennberg, Timothy J., 4,555,957, Cl. 73-864.140.

Chacon, M. Frank: *See*—
Brifman, Josef; Chacon, M. Frank; Schmerda, Richard F.; and Smith, Frank E., 4,556,882, Cl. 340-825.060.

Chadwick, Curt H.: *See*—
Sandland, Paul; Chadwick, Curt H.; and Dwyer, Howard I., 4,556,317, Cl. 356-237.000.

Chan, Dominic K.; Lee, Kwok P.; and Martin, Ronald B., to AT&T Bell Laboratories. Arrangement for routing data packets through a circuit switch. 4,556,972, Cl. 370-60.000.

Chandler, Gregory M.: *See*—
Frey, G. Robert; Chandler, Gregory M.; and King, Richard A., 4,556,117, Cl. 180-89.130.

Chang, Nelson S. Bubbling self-propelled toy. 4,556,392, Cl. 446-16.000.

Chapman, Athol W.; Cope, Fred E.; and Missick, Kenneth P. Transportable article holder for stadium-type chairs. 4,556,250, Cl. 297-192.000.

Chapman, John R., to Sundstrand Corporation. Double output torque limiter. 4,556,131, Cl. 192-7.000.

Charles Stark Draper Laboratory, Inc., The: *See*—
Rourke, Jonathan M.; and Whitney, Daniel E., 4,556,203, Cl. 267-141.100.

Chastrette, Francine; Bracoud, Corinne; and Chastrette, Maurice, to Societe Francaise Hoechst. 4,5-Dialkoxy-1,3-dioxolane-2-carboxylic acids, their derivatives, preparation process and application. 4,556,718, Cl. 549-449.000.

Chastrette, Maurice: *See*—
Chastrette, Francine; Bracoud, Corinne; and Chastrette, Maurice, 4,556,718, Cl. 549-449.000.

Chatelin, Roger: *See*—
Wattiez, Daniel; Chatelin, Roger; and Bourgeois, Michel, 4,556,721, Cl. 556-128.000.

Cheater, Maurice J. Cladding systems. 4,555,879, Cl. 52-90.000.

Chem-Fleur International, Inc.: *See*—
McKenna, James E.; and Plocek, Thomas, 4,556,743, Cl. 568-433.000.

Chemische Werke Huels Aktiengesellschaft: *See*—
Kampf, Wolfgang; and Herrmann, Christoph, 4,556,754, Cl. 585-664.000.

Chen, Chen-Tsung. Toy building block set. 4,556,394, Cl. 446-124.000.

Chen, Hsing-Yao; and Hughes, Richard H., to RCA Corporation. Color picture tube having inline electron gun with coma correction members. 4,556,819, Cl. 313-413.000.

Chen, Michael S.: *See*—
Burgoyne, William F., Jr.; Chen, Michael S.; Dixon, Dale D.; and Edwards, Thomas J., 4,556,546, Cl. 423-226.000.

Chen, Tsong M.: *See*—
Baum, Jonathan S.; and Chen, Tsong M., 4,556,411, Cl. 71-90.000.

Chen, Tu, to Xerox Corporation. Magneto-optic storage media. 4,556,291, Cl. 350-377.000.

Cheng, Hsiang T. Light-adjustment and switch structure for artistic table lamps. 4,556,824, Cl. 315-362.000.

Cheruvu, Subrahmanyam, to Mobil Oil Corporation. Method for conditioning phosphate ores. 4,556,545, Cl. 423-167.000.

Chesney, Joseph J., Jr.; Broney, Scott C.; and Ely, George A., to Tile Council of America, Inc. Fungicidal grout composition. 4,556,426, Cl. 106-18.320.

Cheung, Maxwell C. Offshore oil storage and transfer facility. 4,556,343, Cl. 405-210.000.

Chevalier, Claude, to Compagnie Industrielle de Mechanismes en Abrege C.I.M. Slide mechanism, in particular for an automobile vehicle seat. 4,556,263, Cl. 308-6.00R.

Chevron Research Company: *See*—
Bezman, Richard D., 4,556,646, Cl. 502-66.000.
Duerksen, John H.; Wall, Robert G.; and Knight, Jack D., 4,556,107, Cl. 166-272.000.
Glova, David J., 4,556,496, Cl. 252-33.000.

Chew, Nigel G.: *See*—
Cullis, Anthony G.; Webber, Hugh C.; and Chew, Nigel G., 4,556,524, Cl. 264-1.200.

Chiang, Bing; and Sheleg, Boris, to United States of America, Navy. RF Components and networks in shaped dielectrics. 4,556,855, Cl. 333-113.000.

Chicago Rawhide Mfg. Co.: *See*—
Drygalski, Gordon T.; Otto, Dennis L.; and Ross, Donald K., 4,556,225, Cl. 277-152.000.

Chicopee: *See*—
Shimalla, Charles J., 4,555,811, Cl. 2-51.000.

Chida, Kousaku: *See*—
Suenaga, Masahide; Chida, Kousaku; and Ohura, Masaki, 4,556,925, Cl. 360-113.000.

Chigodo, Yoshikazu: *See*—
Tanaka, Yukio; and Chigodo, Yoshikazu, 4,556,929, Cl. 361-321.000.

Chinoin Gyogyszer es Vegyeszeti Termekek Gyara Rt.: *See*—
Pongor nee Csakvari, Marianna; Nagy, Gabor; Horvath, Gabor; David nee Kenez, Maria; Bozsoky, Sandor; Virag, Sandor; and Marmarosi nee Kellner, Katalin, 4,556,563, Cl. 514-258.000.

Chiyomaru, Isao: *See*—
Nishio, Kazuo; Chiyomaru, Isao; Anma, Katsuo; Yamamoto, Kazuko; Ohno, Hiroshi; and Takayanagi, Noriyasu, 4,556,669, Cl. 514-368.000.

Cho, Timothy C.: *See*—
Lohrey, Edwin J.; and Cho, Timothy C., 4,556,822, Cl. 315-67.000.

Choby, Edward J.: *See*—
Hawkins, Phillip J.; and Choby, Edward J., 4,555,833, Cl. 29-33.00T.

Chow, Laurence C.: *See*—
Brown, Walter E.; and Chow, Laurence C., 4,556,561, Cl. 424-151.000.

Christoffel, Reinhold; and Wesoly, Heiner. Method and device for the accurate setting of machine tools. 4,555,857, Cl. 33-561.000.

Chuang, Strong C.; and Thompson, Hugh A., to Procter & Gamble Company, The. Method of and apparatus for removing liquid for webs of porous material. 4,556,450, Cl. 162-204.000.

Chugai Denki Kogyo, K.K.: *See*—
Shibata, Akira, 4,556,435, Cl. 148-6.350.

Chui, Granger K.: *See*—
King, Edward T.; and Chui, Granger K., 4,556,024, Cl. 123-196.0AB.

Chung, Jen Y. Dust collector for grinder. 4,555,874, Cl. 51-270.000.

Ciba Geigy Corporation: *See*—
Hegar, Gert; and Seiler, Herbert, 4,556,706, Cl. 534-618.000.
Karrer, Friedrich, 4,556,714, Cl. 546-190.000.
Wetter, Hansjurg; Baumeister, Peter; Radimerski, Paul; and Martin, Pierre, 4,556,717, Cl. 548-262.000.

Cimini, Robert F.: *See*—
Eisenberg, Morris L., 4,555,986, Cl. 99-427.000.

Cirkel, Hans-Jurgen; Bette, Willi; and Muller, Reinhard, to Kraftwerk Union Aktiengesellschaft. Laser of the TE type, especially a high-energy laser. 4,556,981, Cl. 372-86.000.

Clark, Keith R.: *See*—
Daugirda, Paul G.; and Clark, Keith R., 4,555,837, Cl. 29-432.100.

Clark, Raymond N., to RCA Corporation. Mode-controlling waveguide-to-coax transition for TV broadcast system. 4,556,853, Cl. 333-26.000.

Clark, William M., Jr.: *See*—
McKenna, Charles M.; Clark, William M., Jr.; and Seliger, Robert L., 4,556,798, Cl. 250-492.200.

Clausen, Eivind, to Allsop, Inc. Apparatus and method for cleaning digital audio discs. 4,556,433, Cl. 134-6.000.

Clavier, Philippe A. Solar furnace. 4,556,047, Cl. 126-400.000.

Clearwater Technologies Inc.: *See*—
Gruenwald, Mark J., 4,556,245, Cl. 294-31.200.

Clegg, John E. Hexagonal conical beam concentrator. 4,556,294, Cl. 350-432.000.

Clements, Laurie J.: *See*—
Belly, Robert T.; and Clements, Laurie J., 4,556,636, Cl. 435-34.000.

Cliffside Pipelayers: *See*—
Thompson, Clifford F.; and Thompson, Lawrence F., 4,556,207, Cl. 269-41.000.

Coal Industry (Patents) Limited: *See*—
Johnston, Arthur M., 4,555,933, Cl. 73-28.000.

Coaltex, Inc.: *See*—
Justice, James C.; and Delli-Gatti, Frank A., Jr., 4,556,257, Cl. 299-68.000.

Coats, Robert P., to Texas Instruments Incorporated. Microwave monolithic spot FET switch configuration. 4,556,808, Cl. 307-571.000.

Cobb, Albert R., III: *See*—
Raab, Andrew F.; and Cobb, Albert R., III, 4,556,764, Cl. 200-16.00C.

Cobb, R. Lynn, to Phillips Petroleum Company. Alkylation process. 4,556,750, Cl. 585-446.000.

Coffey, Gerald P.: *See*—
Curatolo, Benedict S.; and Coffey, Gerald P., 4,556,697, Cl. 525-434.000.

Cohn, Martin; and Welch, Terry A., to Sperry Corporation. Address sequencer for overwrite avoidance. 4,556,960, Cl. 364-200.000.

Cohn, Stanton H.: *See*—
Vartsky, David; Wielopolski, Lucian; LoMonte, Anthony F.; Ellis, Kenneth J.; and Cohn, Stanton H., 4,556,068, Cl. 128-719.000.

Cole, Martin; Howarth, Thomas T.; and Reading, Christopher, to Beecham Group p.l.c. Antibiotics. 4,556,559, Cl. 424-114.000.

Colgate-Palmolive Company: *See*—
Demangeon, Yvon; and Jacques, Alain, 4,556,509, Cl. 252-542.000.

Collet-Cassart, Daniel; Mareschal, Jean-Claude; and Masson, Pierre L., to International Institute of Cellular & Molecular Pathology. Particle agglutination assay of antigens. 4,556,642, Cl. 436-500.000.

Colorcon, Inc.: *See*—
Porter, Stuart C.; Woznicki, Edward J.; Grillo, Susan M.; and D'Andrea, Louis F., 4,556,552, Cl. 424-32.000.

Colt Industries Operating Corp: *See*—
Khoury, Donald S., 4,555,861, Cl. 42-70.00F.
Miller, Robert J., 4,556,032, Cl. 123-438.000.

Compagnie des Produits Industriels de l'Ouest: *See*—
Billet, Maurice; and Lallement, Serge, 4,556,399, Cl. 464-175.000.

Compagnie Generale d'Electricite: *See*—
le Mehaute, Alain; Hamaide, Thierry; Crepy, Gilles; and Marcellin, Georges, 4,556,614, Cl. 429-191.000.

Compagnie Generale pour les Developpements Operationnels des Richesses sous-Marines "C.G. Doris": *See*—
Lamy, Jacques E.; and Serrano, Francisco de Asis M., 4,556,004, Cl. 114-61.000.

Compagnie Industrielle de Mechanismes en Abrege C.I.M.: *See*—
Chevalier, Claude, 4,556,263, Cl. 308-6.00R.

Compagnie International pour l'Informatique Cii-Honeywell Bull (Societe Anonyme): *See*—
Ugon, Michel, 4,556,958, Cl. 364-200.000.

Conner, William R. Waistband indexing method and apparatus. 4,555,999, Cl. 112-121.270.

Conoco Inc.: *See*—
Morton, Arthur W., 4,556,340, Cl. 405-195.000.

Continental Gummi-Werke Aktiengesellschaft: *See*—
Sievers, Willi; Schluter, Hartwig; and de Vries, Gerhard, 4,556,376, Cl. 425-133.500.

Control Data Corporation: *See*—
Putnam, Duane, 4,556,145, Cl. 206-329.000.

Control Instruments Corp.: *See*—
Leach, Thomas W.; and Schaeffer, James, 4,555,930, Cl. 73-23.000.

Converse, Alvin O.; and Grethlein, Hans E., to Dartmouth College, Trustees of. Process for hydrolysis of biomass. 4,556,430, Cl. 127-36.000.

Cook, Michael L.: *See*—
Taylor, Alwyn H.; Lees, Wayne L.; and Cook, Michael L., 4,556,613, Cl. 429-101.000.

Cooke, Joseph: *See*—
Goldenberg, Joseph; and Cooke, Joseph, 4,555,888, Cl. 52-722.000.

Cooper Industries, Inc.: *See*—
Snow, Richard F., 4,556,936, Cl. 362-371.000.

Cooper, John C., to RCA Corporation. Color image display system having an improved external magnetic shield. 4,556,821, Cl. 315-8.000.

Cooper, William K.: *See*—
Dalton, Leslie W., Jr.; Boehm, James A., III; and Cooper, William K., 4,556,069, Cl. 128-746.000.

Cope, Fred E.: *See*—
Chapman, Athol W.; Cope, Fred E.; and Missick, Kenneth P., 4,556,250, Cl. 297-192.000.

Copp, Frederick C.; and Eakins, Kenneth E., to Burroughs Wellcome Co. Pharmaceutical formulations. 4,556,671, Cl. 514-404.000.

Copson, Alexander G., to Adragem Limited. Semi-submersible marine platform. 4,556,008, Cl. 114-265.000.

Corcoran, Richard J.; Kopf, Peter W.; and Smith, Donald F., Jr., to Union Carbide Corporation. Additive for improving weathering resistance and decreasing viscosity of high solids coatings. 4,556,693, Cl. 525-162.000.

Cordis Corporation: *See*—
Barreras, Francisco J.; and Baker, Ira R., 4,556,061, Cl. 128-419.0PT.

Core Laboratories, Inc.: *See*—
Freeman, David L.; and Bush, Darrell C., 4,555,934, Cl. 73-38.000.

Cornell Research Foundation, Inc.: *See*—
Mankowski, Leonard E., 4,555,889, Cl. 52-726.000.

Corso, Fausto. Viewer for reading and/or displaying information recorded on written or printed tape. 4,555,859, Cl. 40-457.000.

Cory, Theodore M.: *See*—
Allen, Wade H.; Cory, Theodore M.; and Thornton, Raymond A., 4,556,959, Cl. 364-900.000.

Cosar, Paul: *See*—
Dutu, Jacques; and Cosar, Paul, 4,555,992, Cl. 110-229.000.

Coten S.r.l.: *See*—
Tringali, Mario, 4,555,878, Cl. 52-81.000.

Couch, Alan T.; Cruickshank, Terence D.; Davey, William L. E.; Marshall, Anthony R.; Tydd, Christopher B.; and Wakeford, David R., to Fluidised Combustion Contractors Limited. Fluidized bed combustion apparatus. 4,556,017, Cl. 122-4.00D.

Coughlin, Peter K.; and Rabo, Jule A., to Union Carbide Corporation. Enhanced catalyst for conversion of syngas to liquid motor fuels. 4,556,645, Cl. 502-66.000.

Coulter Systems Corporation: *See*—
Weber, Harold J.; Kuehnle, Manfred R.; Fraser, Kenneth D.; and Lindblom, Kenneth A., 4,556,309, Cl. 355-3.0TR.

Cox, Aaron J.: *See*—
Scott, Gary W.; and Cox, Aaron J., 4,556,979, Cl. 372-20.000.

Coyne, Richard D.: *See*—
Blechschmid, John; Coyne, Richard D.; Palmer, David; and Piatt, John A., 4,556,785, Cl. 219-460.000.

Craig, Glenn D., to United States of America, National Aeronautics and Space Administration. Optical stereo video signal processor. 4,556,986, Cl. 382-42.000.

Crehan, Donald T.: *See*—
Dwire, Jerold D.; and Crehan, Donald T., 4,556,878, Cl. 340-724.000.

Crepy, Gilles: *See*—
le Mehaute, Alain; Hamaide, Thierry; Crepy, Gilles; and Marcellin, Georges, 4,556,614, Cl. 429-191.000.

Criswell, Peter B.: *See*—
Kregness, Glen R.; Criswell, Peter B.; and DeKarske, Clarence W., 4,556,978, Cl. 371-49.000.

Crosby, Edward L., Jr., to RCA Corporation. Method and apparatus for assaying the purity of a gas. 4,555,932, Cl. 73-24.000.

Cruickshank, Terence D.: *See*—
Couch, Alan T.; Cruickshank, Terence D.; Davey, William L. E.; Marshall, Anthony R.; Tydd, Christopher B.; and Wakeford, David R., 4,556,017, Cl. 122-4.00D.

CTS Corporation: *See*—
Bloom, Terry R.; and Nespor, John F., 4,556,598, Cl. 428-209.000.

Cubalchini, Joseph, to Maremont Corporation. Gas charging fixture for hydropneumatic shock absorbers and the like. 4,556,092, Cl. 141-98.000.

Cubic Corporation: *See*—
McNaul, William F., 4,556,888, Cl. 343-362.000.

Cuisia, Dionisio G., to Dearborn Chemical Company. Composition and method for inhibiting scale. 4,556,493, Cl. 210-699.000.

Cullis, Anthony G.; Webber, Hugh C.; and Chew, Nigel G., to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Method for preparing digital storage device by laser application. 4,556,524, Cl. 264-1.200.

Cunningham, Thomas J., to RCA Corporation. RF Coaxial-strip line connector. 4,556,265, Cl. 339-17.0LC.

Curatolo, Benedict S.; and Coffey, Gerald P., to Standard Oil Company, The. Alternating copolyamide prepared on a polymer matrix. 4,556,697, Cl. 525-434.000.

Curtis, Hazen, III, to AT&T Bell Laboratories. Solder beams leads. 4,556,276, Cl. 339-258.00R.

Curulla, Michael V., to General Electric Company. Nuclear fuel assembly spacer and spring component therefor. 4,556,531, Cl. 376-441.000.

Cyr, John P.: *See*—
Caprio, A. Ronald; Cyr, John P.; Geaghan, Bernard O.; Kotschenreuther, Paul C.; Schanin, David J.; and Salett, Ronald M., 4,556,953, Cl. 364-900.000.

D. E. Hokanson, Inc.: *See*—
Hokanson, D. Eugene; and Arneson, Dennis C., 4,556,067, Cl. 128-663.000.

D. L. Auld Company, The: *See*—
Rockwood, Clyde R., 4,556,588, Cl. 428-13.000.

D. Wickham and Company Limited: *See*—
Barker, Michael D., 4,556,364, Cl. 415-170.00A.

Dahl, Hans; Holik, Herbert; Kurtz, Rudiger; and Stotz, Wolf-Gunter, to Sulzer-Escher Wyss GmbH. Wet press for dewatering a web of material. 4,556,454, Cl. 162-358.000.

Dai Nippon Insatsu Kabushiki Kaisha: *See*—
Kaneki, Satoru; and Tabuchi, Kazuhiro, 4,556,608, Cl. 428-629.000.
Ogata, Naoya; Sanui, Kohei; Azuma, Chiaki; Tanaka, Hozumi; Oguchi, Kiyoshi; Takahashi, Yoichi; and Nakada, Tomihiro, 4,556,619, Cl. 430-17.000.

Daichiku Co., Ltd.: *See*—
Oide, Kunimasa, 4,556,161, Cl. 227-83.000.

Daimler-Benz AG: *See*—
Scholz, Hans J.; and Patzelt, Helmut, 4,556,236, Cl. 280-729.000.

Daimler-Benz Aktiengesellschaft: *See*—
Bender, Franz; Blumensaat, Klaus; and Burthel, Wolfgang, 4,556,170, Cl. 236-86.000.

Dainippon Screen Seizo Kabushiki Kaisha: *See*—
Sakamoto, Takashi, 4,556,901, Cl. 358-75.000.

Dall'Aglio, Carlo: *See*—
Golinelli, Guido; and Dall'Aglio, Carlo, 4,555,855, Cl. 33-147.00K.

Dalton, Leslie W., Jr.; Boehm, James A., III; and Cooper, William K., to Energy Optics, Inc. Method and apparatus for measuring differential auditory system. 4,556,069, Cl. 128-746.000.

Dana Corporation: *See*—
Janson, Gunnar H., 4,556,258, Cl. 301-128.000.

Danby, Hal C.; and Ritson, Carl, to Anatros Corporation. Optical fluid pressure sensor. 4,555,949, Cl. 73-705.000.

Danby, Hal C.; and Ritson, Carl, to Anatros Corporation. Refractive optical fluid pressure sensor. 4,555,950, Cl. 73-705.000.

D'Andrea, Louis F.: *See*—
Porter, Stuart C.; Woznicki, Edward J.; Grillo, Susan M.; and D'Andrea, Louis F., 4,556,552, Cl. 424-32.000.

Daniels, Edward P.; and Dlugos, Daniel F., to Pitney Bowes Inc. Voice responsive automated mailing system. 4,556,944, Cl. 364-466.000.

Danshin, Boris V.: *See*—
Aspiotis, Evgeny K.; Vitjuk, Boris Y.; Malakhov, Evgeny I.; Danshin, Boris V.; Sokolov, Vladimir A.; Sidorov, Anatoly S.; and Volkov, Leonid V., 4,556,847, Cl. 324-307.000.

Dansie, Ryan F.; Holmes, Wendell; and Baird, Denzil B. Electric winch apparatus. 4,556,199, Cl. 254-348.000.

Dario, Paolo; and De Rossi, Danilo E. Composite, multifunctional tactile sensor. 4,555,953, Cl. 73-862.040.

Dartmouth College, Trustees of: *See*—
Converse, Alvin O.; and Grethlein, Hans E., 4,556,430, Cl. 127-36.000.

Dasher, Marie E., to Whirlpool Corporation. Deflectable air baffle assembly for refrigerator. 4,555,915, Cl. 62-448.000.

Data Electronics, Inc.: *See*—
Olmsted, Dennis R., 4,556,923, Cl. 360-93.000.

Daugirda, Paul G.; and Clark, Keith R., to Rheem Manufacturing Company. Method of making an improved water heater tank assembly. 4,555,837, Cl. 29-432.100.

Davey, William L. E.: *See*—
Couch, Alan T.; Cruickshank, Terence D.; Davey, William L. E.; Marshall, Anthony R.; Tydd, Christopher B.; and Wakeford, David R., 4,556,017, Cl. 122-4.00D.

David nee Kenez, Maria: *See*—
Pongor nee Csakvari, Marianna; Nagy, Gabor; Horvath, Gabor; David nee Kenez, Maria; Bozsoky, Sandor; Virag, Sandor; and Marmarosi nee Kellner, Katalin, 4,556,563, Cl. 514-258.000.

Davis, Lois T.: *See*—
Pillis, Lewis J.; and Davis, Lois T., 4,556,638, Cl. 435-253.000.

Davis, Ronald P., to Interlock Industries Limited. Supporting stays for swingable windows having friction and sliding pivots. 4,555,829, Cl. 16-342.000.

DCA Food Industries Inc.: *See*—
Kaufman, Harold B., Jr.; McCarthy, John P.; Entner, Bernard J.; and Wallenfels, Kurt, 4,556,572, Cl. 426-289.000.

Dean, Barry D., to Atlantic Richfield Company. Polymerization initiator. 4,556,512, Cl. 260-239.0BC.

Dearborn Chemical Company: *See*—
Cuisia, Dionisio G., 4,556,493, Cl. 210-699.000.

Deaton, Mark E., to Wright State University. Scissors corrugating device. 4,555,965, Cl. 76-89.100.

Debras, Guy L. G.; De Clippeleir, Georges E. M. J.; and Cahen, Raymond M., to Labofina, S.A. Process for producing isobutene. 4,556,753, Cl. 585-643.000.

De Clippeleir, Georges E. M. J.: *See*—
Debras, Guy L. G.; De Clippeleir, Georges E. M. J.; and Cahen, Raymond M., 4,556,753, Cl. 585-643.000.

Deep Seven Co.: *See*—
Awalt, Thomas Y., Jr., 4,556,007, Cl. 114-210.000.

Deere & Company: *See*—
Wittren, Richard A., 4,556,078, Cl. 137-118.000.

Deering, Roland F.; Hines, John E.; and Dhondt, Roland O., deceased (by Dhondt, Ruth, executor), to Union Oil Company of California. Apparatus for cooling, depressurizing, and moisturizing retorted oil shale. 4,556,458, Cl. 202-227.000.

Degelman Industries Ltd.: *See*—
Degelman, Wilfred J., 4,555,897, Cl. 56-228.000.

Degelman, Wilfred J., to Degelman Industries Ltd. Transportable wide swath trailing implement. 4,555,897, Cl. 56-228.000.

Deger, Johann: *See*—
Muser, Dieter; Raab, Norbert; and Deger, Johann, 4,556,529, Cl. 264-258.000.

DeGroot, Robert H.: *See*—
Fox, James D.; Beckway, Bruce C.; and DeGroot, Robert H., 4,556,167, Cl. 229-45.00R.

Deguchi, Naoyasu: *See*—
Tanemura, Hatsumi; Ukai, Toshinao; Okazaki, Masaki; Deguchi, Naoyasu; Fujita, Munehisa; and Yamamuro, Kiyohiko, 4,556,633, Cl. 430-573.000.

DeKarske, Clarence W.: *See*—
Kregness, Glen R.; Criswell, Peter B.; and DeKarske, Clarence W., 4,556,978, Cl. 371-49.000.

Delagneau, Hubert: *See*—
Weiss, Richard; and Delagneau, Hubert, 4,555,819, Cl. 4-223.000.

Delaite, Jean-Francois: *See*—
Remy, Michel N.; Delaite, Jean-Francois; and Woirgard, Guy J., 4,555,924, Cl. 72-307.000.

Delebecque, Robert P. Device for connecting optical fibers. 4,556,282, Cl. 350-96.210.

Delio, Ralph D.; and Diemer, Donald J. Method and apparatus for preforming a billet with no draft and no flash. 4,555,925, Cl. 72-359.000.

Delli-Gatti, Frank A., Jr.: *See*—
Justice, James C.; and Delli-Gatti, Frank A., Jr., 4,556,257, Cl. 299-68.000.

Demangeon, Yvon; and Jacques, Alain, to Colgate-Palmolive Company. Light duty detergents containing an organic diamine diacid salt. 4,556,509, Cl. 252-542.000.

De Marchi, Jean-Louis: *See*—
Petrini, Roland; and De Marchi, Jean-Louis, 4,555,830, Cl. 24-68.0SK.

De Monte, Arthur P.: *See*—
Kanner, Bernard; Quirk, Jennifer M.; De Monte, Arthur P.; and Hopper, Steven P., 4,556,725, Cl. 556-442.000.

Demoute, Jean-Pierre: *See*—
Martel, Jacques; Tessier, Jean; and Demoute, Jean-Pierre, 4,556,732, Cl. 562-577.000.
Tessier, Jean; Demoute, Jean-Pierre; and Cadiergue, Joseph, 4,556,666, Cl. 514-351.000.

Denike, Stuart K.: *See*—
Torbov, Tsvetan I.; Offen, George R.; and Denike, Stuart K., 4,555,996, Cl. 110-345.000.

Denis, Michel, to Stein Heurtey S.A. Furnace with refractory beams. 4,556,385, Cl. 432-122.000.

Dentsply Research & Development Corp.: *See*—
Burnett, Arthur P.; and Bollinger, Wayne C., 4,556,534, Cl. 420-445.000.

De Rossi, Danilo E.: *See*—
Dario, Paolo; and De Rossi, Danilo E., 4,555,953, Cl. 73-862.040.
Derrien, Michel: *See*—
Veaux, Jacques; and Derrien, Michel, 4,556,179, Cl. 244-102.00R.
Deutsch Texaco Aktiengesellschaft: *See*—
Humbert, Heiko; and Laping, Karlheinz, 4,556,736, Cl. 564-204.000.
Deutsche Forschungs- und Versuchsanstalt fur Luft- und Raumfahrt e.V.: *See*—
Gauert, Rolf; Rodloff, Rudiger K.; and Siol, Gerald H., 4,556,319, Cl. 356-350.000.
Devitt, Charles J.; Freeman, LeRoy M.; and Slater, Saul I., to Slater Electric Inc. Emergency light switch. 4,556,863, Cl. 340-81.00R.
de Vries, Gerhard: *See*—
Sievers, Willi; Schluter, Hartwig; and de Vries, Gerhard, 4,556,376, Cl. 425-133.500.
Dewitt, B. Chris, to Motorola, Inc. Power multiplexer switch and method. 4,556,804, Cl. 307-296.00R.
D'Hondt, Jean-Pierre, to Intercontrole Societe Anonyme. Eddy current testing device with a balancing digital memory. 4,556,846, Cl. 324-238.000.
Dhondt, Roland O., deceased: *See*—
Deering, Roland F.; Hines, John E.; and Dhondt, Roland O., deceased, 4,556,458, Cl. 202-227.000.
Dhondt, Ruth, executor: *See*—
Deering, Roland F.; Hines, John E.; and Dhondt, Roland O., deceased, 4,556,458, Cl. 202-227.000.
Dickenson, Royston J.; and Jaswa, Vijay C., to General Electric Company. Adjustable gain controller for valve position control loop and method for reducing jitter. 4,556,956, Cl. 364-162.000.
Dickerson, Richard C.; and Miller, William S., to Ecolochem, Inc. Deoxygenation process. 4,556,492, Cl. 210-668.000.
Dickman, Lloyd I.; and Strecker, William D., to Digital Equipment Corporation. Central processor with instructions for processing sequences of characters. 4,556,951, Cl. 364-900.000.
Diekman, Robert L., to Huffy Corporation, The. Bicycle kickstand. 4,556,230, Cl. 280-301.000.
Diemer, Donald J.: *See*—
Delio, Ralph D.; and Diemer, Donald J., 4,555,925, Cl. 72-359.000.
Dienglewicz, Anthony M.: *See*—
Howells, Anthony P. S.; Dienglewicz, Anthony M.; Viswanathan, Raman; and Angehrn, Jorg A., 4,556,884, Cl. 340-860.000.
Diesel Equipment Limited: *See*—
Martin, John C., 4,556,129, Cl. 187-41.000.
Dietrich, Anton, to Optische Werke G. Rodenstock. Pad assembly for eyeglass frames. 4,556,300, Cl. 351-137.000.
Diettrich, Lambert J., Jr.; and Servas, Francis M., to Shiley Incorporated. Membrane oxygenator. 4,556,489, Cl. 210-321.300.
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Dickman, Lloyd I.; and Strecker, William D., 4,556,951, Cl. 364-900.000.
Digonnet, Michel J. F.: *See*—
Shaw, Herbert J.; and Digonnet, Michel J. F., 4,556,279, Cl. 350-96.150.
Dijkman, Berend J., to Thomassen & Drijver-Verblifa N.V. Apparatus for placing cones in a box. 4,555,892, Cl. 53-142.000.
di Monteforte, Francesco V. Rigid thermoinsulating movable covering for greenhouses and the like. 4,555,865, Cl. 47-17.000.
Director-General of the Agency of Industrial Science and Technology: *See*—
Nagata, Sumio; Kanaiwa, Kazuhide; and Ichikawa, Takashi, 4,556,096, Cl. 164-79.000.
Dischert, Robert A.; and Meise, William H., to RCA Corporation. Kinescope blanking scheme for wide-aspect ratio television. 4,556,906, Cl. 358-180.000.
Diver, Marius: *See*—
Bordet, Rene ; Grovalet, Yves; Caudron, Lionel; and Diver, Marius, 4,555,881, Cl. 52-167.000.
Dixon, Dale D.: *See*—
Burgoyne, William F., Jr.; Chen, Michael S.; Dixon, Dale D.; and Edwards, Thomas J., 4,556,546, Cl. 423-226.000.
Dlugos, Daniel F.: *See*—
Daniels, Edward P.; and Dlugos, Daniel F., 4,556,944, Cl. 364-466.000.
Dompe' Farmaceutica S.p.A.: *See*—
Giani, Roberto; Parini, Ettore; and Tonon, Giancarlo, 4,556,653, Cl. 514-220.000.
Donner, Meinrad: *See*—
Bloch, Peter; Schneider, Otto; and Donner, Meinrad, 4,555,871, Cl. 51-52.00R.
Doorley, Richard B.; Henninger, Paul J.; Klages, Chester F., Jr.; and Shetter, Jerrold K., to Trak-Tech, Inc. Railway track lubricator. 4,556,127, Cl. 184-3.100.
Dorn, Franz; Montavon, Francois; and Suchy, Milos, to Hoffmann-La Roche Inc. Pyridine derivatives. 4,556,661, Cl. 514-277.000.
Dornes, Bryan J.; and Talarico, Robert J., to AMP Incorporated. Connector insertion tool. 4,555,847, Cl. 29-739.000.
Dow Chemical Company, The: *See*—
Eilers, Louis H., 4,556,109, Cl. 166-295.000.
Friedli, Hans R.; and Lau, Philip Y., 4,556,506, Cl. 252-512.000.
Pawloski, Chester E.; and Ginter, Sally P., 4,556,710, Cl. 544-214.000.
Tsang, Albert C.; Holland, Thomas L.; and Masey, Johnny W., 4,556,748, Cl. 568-858.000.
Doyle, Walter M., to Laser Precision Corporation. Interferometer spectrometer having simplified scanning motion control. 4,556,316, Cl. 356-346.000.
Dragerwerk Aktiengesellschaft: *See*—
Walther, Hans J., 4,555,815, Cl. 2-424.000.
Dragstrem, John A. Drain pipe system. 4,555,820, Cl. 4-256.000.
Dragunevicius, Algirdas J.; Kuhfus, Gerd; and Walker, Charles R. S., to Northern Telecom Limited. Simplified line switch for a telephone set. 4,556,763, Cl. 179-164.000.
Dresser Industries, Inc.: *See*—
Howells, Anthony P. S.; Dienglewicz, Anthony M.; Viswanathan, Raman; and Angehrn, Jorg A., 4,556,884, Cl. 340-860.000.
Drygalski, Gordon T.; Otto, Dennis L.; and Ross, Donald K., to Chicago Rawhide Mfg. Co. Reverse lip positive venting seal. 4,556,225, Cl. 277-152.000.
Dubrovskaya, Nina V., administrator: *See*—
Kalakutsky, Lev I.; Sychenkov, Vladimir V.; Vlasov, Vladimir B.; and Dubrovsky, Adolf V., deceased, 4,556,849, Cl. 324-464.000.
Dubrovsky, Adolf V., deceased: *See*—
Kalakutsky, Lev I.; Sychenkov, Vladimir V.; Vlasov, Vladimir B.; and Dubrovsky, Adolf V., deceased, 4,556,849, Cl. 324-464.000.
Duerksen, John H.; Wall, Robert G.; and Knight, Jack D., to Chevron Research Company. Steam injection including alpha-olefin sulfonate dimer surfactant additives and process of stimulating hydrocarbon recovery from a subterranean formation. 4,556,107, Cl. 166-272.000.
Duff-Norton Company, Inc.: *See*—
Rollins, John P., 4,556,832, Cl. 318-467.000.
Duncan, Robert, to Westinghouse Electric Corp. Welding fixture for nuclear reactor fuel assembly grid. 4,556,776, Cl. 219-121.0LC.
Dungs, Horst: *See*—
Weber, Heinrich; Lorenz, Kurt; Dungs, Horst; Bruns, Engelbert; and Osterholt, Gerd, 4,556,455, Cl. 201-39.000.
Dunn, Robert H., to Eaton Corporation. Energy discriminating channel select logic. 4,556,982, Cl. 375-10.000.
Du Pont de Nemours, E. I., and Company: *See*—
Kirayoglu, Birol, 4,556,601, Cl. 428-219.000.
Resnick, Paul R., 4,556,747, Cl. 568-674.000.
Sullivan, Thomas A.; and Witterholt, Vincent G., 4,556,733, Cl. 564-89.000.
Tynan, Daniel G., 4,556,324, Cl. 366-85.000.
Wallace, Lawrence R., 4,556,694, Cl. 525-239.000.
Duracell Inc.: *See*—
Taylor, Alwyn H.; Lees, Wayne L.; and Cook, Michael L., 4,556,613, Cl. 429-101.000.
Dutu, Jacques; and Cosar, Paul, to Fives-Cail Babcock. Coal gasification installation. 4,555,992, Cl. 110-229.000.
Dwire, Jerold D.; and Crehan, Donald T., to International Business Machines Corp. Display of graphics using a non-all points addressable display. 4,556,878, Cl. 340-724.000.
Dwyer, Francis G., to Mobil Oil Corporation. Highly siliceous porous crystalline material ZSM-22 and its use in catalytic dewaxing of petroleum stocks. 4,556,477, Cl. 208-111.000.
Dwyer, Howard I.: *See*—
Sandland, Paul; Chadwick, Curt H.; and Dwyer, Howard I., 4,556,317, Cl. 356-237.000.
Dynamit Nobel AG: *See*—
Seiler, Claus-Dietrich; and Vahlensieck, Hans-Joachim, 4,556,724, Cl. 556-429.000.
E. R. Squibb & Sons, Inc.: *See*—
Snitman, David L.; Haslanger, Martin F.; and Sprague, Peter W., 4,556,675, Cl. 514-469.000.
Eakins, Kenneth E.: *See*—
Copp, Frederick C.; and Eakins, Kenneth E., 4,556,671, Cl. 514-404.000.
Eastcott, Peter D.: *See*—
Trussler, Ronald C.; Stevenson, Andrew C.; and Eastcott, Peter D., 4,556,826, Cl. 318-92.000.
Eastman Kodak Company: *See*—
Belly, Robert T.; and Clements, Laurie J., 4,556,636, Cl. 435-34.000.
Martin, William A., 4,556,303, Cl. 354-141.000.
Pierson, Charles W., 4,556,474, Cl. 204-416.000.
Eaton Corporation: *See*—
Braun, Eugene R., 4,555,959, Cl. 74-334.000.
Brifman, Josef; Chacon, M. Frank; Schmerda, Richard F.; and Smith, Frank E., 4,556,882, Cl. 340-825.060.
Dunn, Robert H., 4,556,982, Cl. 375-10.000.
Morgan, Paul W.; Ellwood, Thomas J.; Amlani, Kish D.; and Hodges, John B., 4,555,955, Cl. 73-862.060.
O'Neil, Walter K., 4,556,116, Cl. 180-79.100.
Soeters, Raymond A., Jr., 4,556,373, Cl. 418-75.000.
Eberhard, Philippe H., to United States of America, Energy. Point sensitive NMR imaging system using a magnetic field configuration with a spatial minimum. 4,556,848, Cl. 324-309.000.
Ebey, Edward W.: *See*—
Richter, Karl E.; and Ebey, Edward W., 4,556,233, Cl. 280-513.000.
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Ohta, Hisao; Baji, Toru; Izawa, Yuji; Ebisui, Eizou; Tsukada, Toshihisa; and Yamamoto, Hideaki, 4,556,800, Cl. 250-578.000.
Eckhard, Pritsch: *See*—
Kasper, Horst; and Eckhard, Pritsch, 4,556,810, Cl. 310-256.000.
Ecolochem, Inc.: *See*—
Dickerson, Richard C.; and Miller, William S., 4,556,492, Cl. 210-668.000.
Eddy, Bryon C.: *See*—
Prescott, Leo L., Jr.; and Eddy, Bryon C., 4,556,041, Cl. 124-35.00A.

Eder, Erich: *See*—
Anetzberger, Max; and Eder, Erich, 4,556,021, Cl. 123-185.00S.
Edwards, Thomas J.: *See*—
Burgoyne, William F., Jr.; Chen, Michael S.; Dixon, Dale D.; and Edwards, Thomas J., 4,556,546, Cl. 423-226.000.
Egawa, Kinsho, to Genroku Corporation. Rotary board. 4,555,990, Cl. 108-20.000.
Eggebrecht, Lewis C.: *See*—
Brewer, James A.; Eggebrecht, Lewis C.; Kummer, David A.; and McHugh, Patricia P., 4,556,952, Cl. 364-900.000.
Egli, Walter; Ragaller, Klaus; Schade, Ekkehard; and Stelzer, Roland, to BBC Brown, Boveri & Company, Ltd. Gas-blast circuit breaker. 4,556,767, Cl. 200-148.00A.
Ehlermann, Hans-Dieter. Process and apparatus for binding books. 4,556,353, Cl. 412-5.000.
Eilers, Louis H., to Dow Chemical Company, The. Process for cementing geothermal wells. 4,556,109, Cl. 166-295.000.
Eimer, Klaus: *See*—
Bochinski, Rolf; Eimer, Klaus; Lange, Alois; and Nghiem, Xuan L., 4,556,102, Cl. 165-95.000.
Eisenberg, Morris L., to Cimini, Robert F., a part interest. Cage rotisserie. 4,555,986, Cl. 99-427.000.
Electric Indicator Company, Inc.: *See*—
Hendricks, Howard F., 4,556,811, Cl. 310-266.000.
Electro-Matic Staplers, Inc.: *See*—
Weigert, Hans, 4,556,803, Cl. 307-140.000.
Electronique Serge Dassault: *See*—
Pailler, Alain L. N., 4,556,334, Cl. 400-124.000.
Elert, Karl, to Stroh Brewery Company, The. Apparatus for pressure testing of can bodies and lids. 4,555,935, Cl. 73-52.000.
El Kadiri Cherkaoui el Mourali, Fouzia: *See*—
Armand, Michel B.; and El Kadiri Cherkaoui el Mourali, Fouzia, 4,556,616, Cl. 429-192.000.
Elkin, Luther V. Concrete mixing and distribution equipment. 4,556,323, Cl. 366-31.000.
Ellis, Charles S.: *See*—
Bolin, Philip C.; Bowman, Gary K.; Ellis, Charles S.; Hopkins, Melvyn D.; and Kane, Richard E., 4,556,755, Cl. 174-21.00C.
Ellis, Kenneth J.: *See*—
Vartsky, David; Wielopolski, Lucian; LoMonte, Anthony F.; Ellis, Kenneth J.; and Cohn, Stanton H., 4,556,068, Cl. 128-719.000.
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Morgan, Paul W.; Ellwood, Thomas J.; Amlani, Kish D.; and Hodges, John B., 4,555,955, Cl. 73-862.060.
Elslager, Edward F.: *See*—
Showalter, Howard D. H.; Johnson, Judith L.; Werbel, Leslie M.; and Elslager, Edward F., 4,556,654, Cl. 514-222.000.
Ely, Donald A., to Beloit Corporation. Method of and apparatus for substantially equal compacting and dewatering of both faces of freshly felted paper web. 4,556,451, Cl. 162-205.000.
Ely, George A.: *See*—
Chesney, Joseph J., Jr.; Broney, Scott C.; and Ely, George A., 4,556,426, Cl. 106-18.320.
Emery Industries Inc.: *See*—
Fayter, Richard G., Jr.; and Hall, Allen L., 4,556,409, Cl. 71-76.000.
Emmett, John C.; Slater, Robert A.; and Warrington, Brian H., to Smith Kline & French Laboratories Ltd. 5-(4-Amino or acylaminophenyl)-2(1H)-pyrazinones having inotropic activity. 4,556,711, Cl. 544-357.000.
EMPI, Inc.: *See*—
Maurer, Donald D., 4,556,051, Cl. 128-1.500.
Endou, Hajime, to Mitsui Engineering & Shipbuilding Co., Ltd. Method of and system for utilizing thermal energy accumulator. 4,555,905, Cl. 60-659.000.
Endress U. Hauser GmbH u. Co.: *See*—
Regtien, Paulus P. L., 4,556,330, Cl. 374-185.000.
Energy-Adaptive Grinding, Inc.: *See*—
Smith, Roderick L., 4,555,873, Cl. 51-165.870.
Energy Innovations, Inc.: *See*—
Gourdine, Meredith C., 4,555,909, Cl. 62-64.000.
Energy Optics, Inc.: *See*—
Dalton, Leslie W., Jr.; Boehm, James A., III; and Cooper, William K., 4,556,069, Cl. 128-746.000.
Energy Systems, Inc.: *See*—
Riley, James E.; and Tyson, Neil W., 4,556,082, Cl. 137-375.000.
Engelhardt, Rolf D., to Engelhardt, Rolf Dieter. Heat exchanger. 4,556,104, Cl. 165-145.000.
Engelhardt, Rolf Dieter: *See*—
Engelhardt, Rolf D., 4,556,104, Cl. 165-145.000.
Enichimica S.p.A.: *See*—
Bialy, Jan; Penczek, Irena; Maczenski, Stanislaw; and Borensztajn, Marek, 4,556,699, Cl. 526-68.000.
Enomoto, Masao: *See*—
Sunagawa, Makoto; Goda, Koshiro; Enomoto, Masao; and Sasaki, Akira, 4,556,514, Cl. 260-239.00A.
Ensign-Bickford Industries, Inc.: *See*—
Tietje, Andreas, 4,556,795, Cl. 250-324.000.
Entner, Bernard J.: *See*—
Kaufman, Harold B., Jr.; McCarthy, John P.; Estner, Bernard J.; and Wallenfels, Kurt, 4,556,572, Cl. 426-289.000.
Environmental Research Institute of Michigan: *See*—
Tai, Anthony M.; and Aleksoff, Carl C., 4,556,950, Cl. 364-827.000.
Era, Vaino : *See*—
Lindberg, Jarl J.; Era, Vaino ; and Strom, Erkki, 4,556,425, Cl. 106-14.230.
Erckel, Rudiger; Franz, Raimund; Woernle, Rolf; and Riehm, Theodor, to Hoechst Aktiengesellschaft. Process for hydrolyzing cellulose-containing material with gaseous hydrogen fluoride. 4,556,431, Cl. 127-37.000.
Erckel, Rudiger; Franz, Raimund; Woernle, Rolf; and Riehm, Theodor, to Hoechst Aktiengesellschaft. Process for hydrolyzing cellulose-containing material with gaseous hydrogen fluoride. 4,556,432, Cl. 127-37.000.
Erdman, David M., to General Electric Company. Laundering apparatus, method of operating a laundry machine, control system for an electronically commutated motor, method of operating an electronically commutated motor, and circuit. 4,556,827, Cl. 318-254.000.
Erhardt, Paul W.; Hagedorn, Alfred A., III; Lumma, William C., Jr.; and Wohl, Ronald A., to Schering A.G. Cardiotonic 1,3-dihydro-4-[[(imidazol-1-yl)aryl]carbonyl]imidazol-2-ones. 4,556,665, Cl. 514-338.000.
Erhardt, Paul W.; and Woo, Chi, to American Hospital Supply Corporation. Ethylenediamine derivatives of aryloxypropanolamine aryl esters having various medicinal properties. 4,556,668, Cl. 514-353.000.
Erhart, Georg, to U.S. Philips Corporation. VCR With improved tape threading and guiding. 4,556,922, Cl. 360-85.000.
Eriksson, Bengt O., to Sala International Aktiebolag. Arrangement at a shaft seal. 4,556,239, Cl. 384-130.000.
Erlichman, Irving, to Polaroid Corporation. Thermal transfer recording system and method. 4,556,892, Cl. 346-76.0PH.
Erndt, Hans: *See*—
Lengsfeld, Karl; Link, Erich; and Erndt, Hans, 4,556,132, Cl. 192-12.0BA.
Erpenbach, Heinz; Gehrmann, Klaus; Lork, Winfried; and Prinz, Peter, to Hoechst Aktiengesellschaft. Process for purifying and recovering contaminated catalyst solution obtained in the carbonylation of methyl acetate and/or dimethylether. 4,556,644, Cl. 502-33.000.
Esbenshade, Kenneth L., to North Carolina State University. Process for the immunological neutering of animals. 4,556,555, Cl. 424-85.000.
Escher Wyss Limited: *See*—
Bartesch, Helmut; and Florin, Gerd, 4,556,573, Cl. 426-467.000.
Esselte Pac Aktiebolag: *See*—
Bogren, Ingemar S. B., 4,556,152, Cl. 220-276.000.
Etablishments Francois Salomon et Fils S.A.: *See*—
Petrini, Roland; and De Marchi, Jean-Louis, 4,555,830, Cl. 24-68.0SK.
Ethyl Corporation: *See*—
Laurent, Sebastian M.; and Sanders, Robert N., 4,556,564, Cl. 426-2.000.
Etzbach, Karl-Heinz: *See*—
Neumann, Peter; Etzbach, Karl-Heinz; and Hoffmann, Gerhard, 4,556,622, Cl. 430-58.000.
Evans, Geoffrey R., to APV International Limited. Gasketing for heat exchanger plates. 4,556,106, Cl. 165-166.000.
Evans, Harmon A., to Westinghouse Electric Corp. Process for combination metal reduction and distillation. 4,556,420, Cl. 75-84.500.
Everson, Charles W.: *See*—
Swartz, William E.; Everson, Charles W.; and Bender, Fredric G., 4,556,571, Cl. 426-265.000.
Ewing, John J.: *See*—
Fecik, Michael T.; Frank, Robert G.; Ewing, John J.; and Siminerio, Andrew C., 4,556,407, Cl. 65-289.000.
Fecik, Michael T.; Frank, Robert G.; and Ewing, John J., 4,556,408, Cl. 65-289.000.
Exeter, George M., to Ferranti plc. Radar systems. 4,556,887, Cl. 343-8.000.
Exxon Production Research Co.: *See*—
Kirby, Robert A., 4,556,120, Cl. 181-120.000.
Exxon Research and Engineering Co.: *See*—
Mauldin, Charles H.; and Payne, Virgil L., 4,556,752, Cl. 585-640.000.
Faasse, Adrian L., Jr. Pharmaceutical packaging method. 4,556,441, Cl. 156-247.000.
Fahey, Dennis M., to Tar Heel Technologies, Inc. Method for reinforcing pavement. 4,556,338, Cl. 404-28.000.
Faitel, William M., to Lamb Technicon Corp. Reciprocating linear conveyor drive. 4,556,141, Cl. 198-750.000.
Falou, Armand S.: *See*—
Bluthe, Norbert; Falou, Armand S.; and Gore, Jacques, 4,556,742, Cl. 568-403.000.
Fan, John C. C.; and Bachner, Frank J., to Massachusetts Institute of Technology. Transparent heat-mirror. 4,556,277, Cl. 350-1.700.
Fanuc Ltd.: *See*—
Kishi, Hajimu; Seki, Masaki; Tanaka, Kunio; and Takegahara, Takashi, 4,556,833, Cl. 318-567.000.
Farge, Daniel; Leger, Andre ; and Ponsinet, Gerard, to Rhone-Poulenc Sante. 6-(1,8-Naphthyridin-2-yl)-dithiino[1,4][2,3-c]-pyrroles useful as tranquillizing and anticonvulsant agents. 4,556,657, Cl. 514-252.000.
Farmos Group Ltd.: *See*—
Sodervall, Marja-Liisa; Kurkela, Kauko O. A.; Karjalainen, Arto J.; Toivola, Reijo J.; Kangas, Lauri V. M.; and Blanco, Guillermo L., 4,556,677, Cl. 514-651.000.
Farr, Glyn P. R., to Lucas Industries Public Limited Company. Hydraulic anti-skid braking systems for vehicles. 4,556,261, Cl. 303-116.000.
Farrar, David; and Benn, Gerald P., to Allied Colloids Limited. Separation of methanol from mixtures containing it. 4,556,728, Cl. 560-217.000.
Fathauer, George H.; and Hood, Charles F., to Berwind Corporation. Capacitance-type material level indicator. 4,555,941, Cl. 73-304.00C.

Fauss, Rudolf: *See—*
Salzburg, Herbert; Fauss, Rudolf; Findeisen, Kurt; and Homeyer, Bernhard, 4,556,649, Cl. 514-63.000.

Fayter, Richard G., Jr.; and Hall, Allen L., to Emery Industries Inc. 2-Vinyl- and 2-ethylcyclopropane monocarboxylates as plant growth modifiers. 4,556,409, Cl. 71-76.000.

Fecik, Michael T.; Frank, Robert G.; Ewing, John J.; and Siminerio, Andrew C., to PPG Industries, Inc. Tempering ring with pivoting glass sheet support member. 4,556,407, Cl. 65-289.000.

Fecik, Michael T.; Frank, Robert G.; and Ewing, John J., to PPG Industries, Inc. Dual ring segmented block tempering ring. 4,556,408, Cl. 65-289.000.

Feldmann, Joachim; and Schlamann, Wilhelm, to WABCO Westinghouse Fahrzengbremsen. Air brake system. 4,556,259, Cl. 303-7.000.

Fenn & Company: *See—*
Fenn, George S., 4,556,505, Cl. 252-194.000.

Fenn, George S., to Fenn & Company. Material for drying cut plants and grains and methods of facilitating such drying. 4,556,505, Cl. 252-194.000.

Fergason, James L., to Manchester R & D Partnership. Low birefringence encapsulated liquid crystal and optical shutter using same. 4,556,289, Cl. 350-350.00R.

Ferranti plc: *See—*
Exeter, George M., 4,556,887, Cl. 343-8.000.

Ferraro, Thomas A., to Lock Jaws, Inc. Jaw locking mechanism for lathe chucks having a soft jaw, a master jaw and a key block. 4,556,228, Cl. 279-1.0SJ.

Fiat Trattori S.p.A.: *See—*
Bucarelli, Luciano, 4,555,962, Cl. 74-710.500.

Fiberlux, Inc.: *See—*
Mancuso, Paul, 4,555,868, Cl. 49-181.000.

Figgie International Inc.: *See—*
Johnson, Peter A., 4,556,143, Cl. 198-841.000.

Finast Marking Supplies Inc.: *See—*
Scrudato, Frederick, 4,556,012, Cl. 118-268.000.

Findeisen, Kurt: *See—*
Salzburg, Herbert; Fauss, Rudolf; Findeisen, Kurt; and Homeyer, Bernhard, 4,556,649, Cl. 514-63.000.

Finike Italiana Marposs S.p.A.: *See—*
Golinelli, Guido; and Dall'Aglio, Carlo, 4,555,855, Cl. 33-147.00K.

Finn, Kellen M.: *See—*
Bowman, Kenneth A.; Jacoby, John E.; and Finn, Kellen M., 4,556,535, Cl. 420-580.000.

Firestone Tire & Rubber Company, The: *See—*
Nadeau, John F., Jr.; and Varvaro, Alexander J., 4,556,382, Cl. 425-462.000.

Fischer, Herbert; Kickhofen, Botho; and Vaubel, Eckehard, to Max-Planck-Gesellschaft zur Forderung der/Wissenschaften e.V. Transparent fluid bandage material and the preparation and use thereof. 4,556,056, Cl. 128-156.000.

Fischer, Thomas, to Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung. Connecting rod made of fiber reinforced synthetic material. 4,555,961, Cl. 74-579.00E.

Fisher, Almon P.: *See—*
Hermanson, Herman A.; and Fisher, Almon P., 4,556,890, Cl. 346-74.400.

Fitz, Herbert: *See—*
Neumann, Wolfgang; Hendriock, Hans-Jurgen; and Fitz, Herbert, 4,556,589, Cl. 428-35.000.

Fives-Cail Babcock: *See—*
Dutu, Jacques; and Cosar, Paul, 4,555,992, Cl. 110-229.000.

Flamme, Jean M.: *See—*
Leroy, Andre ; and Flamme, Jean M., 4,556,372, Cl. 418-1.000.

Flanagin, Stephen D.; Bubb, Howard G.; and Scantlin, John R., to United Technologies Corporation. PBX Telephone system remote synchronization. 4,556,970, Cl. 370-58.000.

Flo-Con Systems, Inc.: *See—*
Shapland, Earl P., 4,556,157, Cl. 222-600.000.

Florin, Gerd: *See—*
Bartesch, Helmut; and Florin, Gerd, 4,556,573, Cl. 426-467.000.

Fluidised Combustion Contractors Limited: *See—*
Couch, Alan T.; Cruickshank, Terence D.; Davey, William L. E.; Marshall, Anthony R.; Tydd, Christopher B.; and Wakeford, David R., 4,556,017, Cl. 122-4.00D.

Fluidyne Corporation: *See—*
Yie, Gene G., 4,555,872, Cl. 51-439.000.

FMC Corporation: *See—*
Baum, Jonathan S.; and Chen, Tsong M., 4,556,411, Cl. 71-90.000.
Braksmayer, Diza P., 4,556,698, Cl. 325-469.000.
Gunkel, Louis T.; and Juelke, Charles V., 4,556,684, Cl. 524-141.000.
Post, Steven W., 4,556,371, Cl. 417-539.000.
Rosseau, Richard B., 4,555,824, Cl. 15-87.000.

Fodor, Peter: *See—*
Barnes, Ramon M.; and Fodor, Peter, 4,556,318, Cl. 356-316.000.

Foerster, David: *See—*
Mason, James S.; and Foerster, David, 4,555,974, Cl. 91-363.00A.

Follert, Hans G.; Rzepka, Herbert; and Schwert, Martin, to Gewerkschaft Eisenhutte Westfalia. Cutting appliances for use in tunnel driving operations. 4,556,256, Cl. 299-33.000.

Foote, Steven A.: *See—*
Hanson, Richard A.; and Foote, Steven A., 4,555,944, Cl. 73-517.00B.

Ford Motor Company: *See—*
Giebel, Frank, 4,556,235, Cl. 280-690.000.
Horvath, Stanley K., 4,556,686, Cl. 524-315.000.
King, Edward T.; and Chui, Granger K., 4,556,024, Cl. 123-196.0AB.
Stoddard, John P., 4,555,958, Cl. 74-10.330.

Fotodyne, Incorporated: *See—*
Vitek, Richard K.; and Smoot, Jeffrey B., 4,556,914, Cl. 358-244.000.

Four Brain Company Ltd.: *See—*
Ueno, Masato; Sato, Masayoshi; Tasaka, Mitsuyuki; and Naito, Tatsuro, 4,556,389, Cl. 433-206.000.

Fowler, Robert C.: *See—*
Thibault, William C.; and Fowler, Robert C., 4,556,612, Cl. 429-54.000.

Fox, James D.; Beckway, Bruce C.; and DeGroot, Robert H., to Packing Materials Corporation. Velcro fastening arrangement for reclosable carton flaps. 4,556,167, Cl. 229-43.00R.

Framelock International Pty. Limited: *See—*
Marshall, Stuart R., 4,556,337, Cl. 403-255.000.

Francois, de Reinach Hirtzbach: *See—*
Ambrosi, Dominique; and Francois, de Reinach Hirtzbach, 4,556,414, Cl. 71-94.000.

Frank, Robert G.: *See—*
Fecik, Michael T.; Frank, Robert G.; Ewing, John J.; and Siminerio, Andrew C., 4,556,407, Cl. 65-289.000.
Fecik, Michael T.; Frank, Robert G.; and Ewing, John J., 4,556,408, Cl. 65-289.000.

Frankel, Arthur E.; Johnson, Larry J.; and Wennberg, Timothy J., to Cetus Corporation. Bi-directional liquid sample handling system. 4,555,957, Cl. 73-864.140.

Frankl & Kirchner GmbH & Co.: *See—*
Lengsfeld, Karl; Link, Erich; and Erndt, Hans, 4,556,132, Cl. 192-12.0BA.

Franz, Curtis A.: *See—*
Megna, Ignazio S.; and Franz, Curtis A., 4,556,703, Cl. 528-49.000.

Franz, John E.; and Zwikelmaier, Kurt E., to Monsanto Company. Bis-(alkoxy)tetrathiotricarboxylates and use as herbicides thereof. 4,556,415, Cl. 71-100.000.

Franz Plasser Bahn-baumaschinen-Industriegesellschaft m.b.H.: *See—*
Theurer, Josef; and Brunninger, Manfred, 4,556,112, Cl. 171-16.000.

Franz, Raimund: *See—*
Erckel, Rudiger; Franz, Raimund; Woernle, Rolf; and Riehm, Theodor, 4,556,431, Cl. 127-37.000.
Erckel, Rudiger; Franz, Raimund; Woernle, Rolf; and Riehm, Theodor, 4,556,432, Cl. 127-37.000.

Fraser, Kenneth D.: *See—*
Weber, Harold J.; Kuehnle, Manfred R.; Fraser, Kenneth D.; and Lindblom, Kenneth A., 4,556,309, Cl. 355-3.0TR.

Frater, Georg; Suchy, Milos; Wenger, Jean; and Winternitz, Paul, to Hoffmann-La Roche Inc. Certain aryloxy-benzoylsulfoximines having herbicidal activity. 4,556,413, Cl. 71-94.000.

Frawley, Adrian J. Air admittance valve. 4,556,084, Cl. 137-526.000.

Frech, Alfred, to Robert Bosch GmbH. Hand plane, in particular a hand plane machine designed as an electric hand tool machine. 4,555,850, Cl. 30-490.000.

Fred Silver & Company, Inc.: *See—*
Silver, Frederick, 4,556,299, Cl. 350-603.000.

Freeman, David L.; and Bush, Darrell C., to Core Laboratories, Inc. Method and apparatus for nonsteady state testing of permeability. 4,555,934, Cl. 73-38.000.

Freeman, LeRoy M.: *See—*
Devitt, Charles J.; Freeman, LeRoy M.; and Slater, Saul I., 4,556,863, Cl. 340-81.00R.

Freund Industrial Co., Ltd.: *See—*
Motoyama, Shimesu; Kurita, Kaora; Sakashita, Shizuka; Takei, Narimichi; and Ohno, Shigeru, 4,556,175, Cl. 241-57.000.

Frey, G. Robert; Chandler, Gregory M.; and King, Richard A., to Joy Manufacturing Company. Free floating operator compartment. 4,556,117, Cl. 180-89.130.

Freymiller, Edward: *See—*
Lockery, Harry E.; and Freymiller, Edward, 4,556,115, Cl. 177-211.000.

Fried. Krupp Gesellschaft mit beschrankter Haftung: *See—*
Philippi, Engelbert, 4,556,345, Cl. 407-114.000.

Friedli, Hans R.; and Lau, Philip Y., to Dow Chemical Company, The. Aqueous electroconductive compositions. 4,556,506, Cl. 252-512.000.

Friedmann & Maier Aktiengesellschaft: *See—*
Brasseur, Georg, 4,556,838, Cl. 323-285.000.

Friedrich Wilh. Schwing GmbH: *See—*
Schwing, Friedrich, 4,556,370, Cl. 417-517.000.

Frost, Kenneth S.; Halberstadt, Alex L.; and Letchford, John A., to Thorn EMI Domestic Appliances Limited. Heating apparatus. 4,556,786, Cl. 219-464.000.

Frutin, Bernard D., to Rocep-Lusol Holdings Limited. Pressurized dispensing apparatus. 4,556,156, Cl. 222-386.500.

Fry, Richard B. Multi-harness loom control. 4,556,945, Cl. 364-470.000.

Fu, Yun-Lung; and Wang, Samuel S., to American Cyanamid Company. Neutral hydrocarboxycarbonyl thiourea sulfide collectors. 4,556,483, Cl. 209-166.000.

Fuji Electric Company, Inc.: *See—*
Hongo, Yasuo, 4,556,985, Cl. 382-30.000.

Fuji Electric Company, Ltd.: *See—*
Shotaro, Yokoyama; and Takashi, Nishibe, 4,556,789, Cl. 250-206.000.
Tominaga, Hiroshi, 4,556,198, Cl. 254-122.000.

Fuji Jukogyo Kabushiki Kaisha: *See—*
Sugiura, Katsuhiko, 4,556,031, Cl. 123-437.000.
Takano, Toshio, 4,556,134, Cl. 192-103.00F.

Fuji Koki Manufacturing Co., Ltd.: *See—*
Yoshiga, Kenji, 4,556,193, Cl. 251-129.110.

Fuji Photo Film Co., Ltd.: *See—*
Fukuda, Hiroshi, 4,556,304, Cl. 354-288.000.
Furutachi, Nobuo; Nakamura, Kotaro; and Hirose, Takeshi, 4,556,630, Cl. 430-372.000.
Sato, Kozo; Fujita, Shinsaku; Nakamura, Koichi; and Naito, Hideki, 4,556,632, Cl. 430-562.000.
Sato, Susumu; and Hara, Yoshio, 4,556,631, Cl. 430-498.000.
Tanemura, Hatsumi; Ukai, Toshinao; Okazaki, Masaki; Deguchi, Naoyasu; Fujita, Munehisa; and Yamamuro, Kiyohiko, 4,556,633, Cl. 430-573.000.
Tisue, Gil, 4,556,910, Cl. 358-212.000.

Fuji Seiki Machine Works, Ltd.: *See—*
Ohtake, Matsuo, 4,555,876, Cl. 51-418.000.

Fujibayashi, Kenji, to Olympus Optical Co., Ltd. Tape recorder motor circuit. 4,556,919, Cl. 360-74.100.

Fujioka, Futoshi; Boden, Richard M.; and Schreiber, William L., to International Flavors & Fragrances Inc. 4(p-Cumenyloxy)-3-methyl-1-butanol. 4,556,746, Cl. 568-648.000.

Fujioka, Syozo: *See—*
Saita, Kenji; and Fujioka, Syozo, 4,556,501, Cl. 252-70.000.

Fujishima, Nobuichi; and Ichikawa, Kuniharu, to Matsushita Electric Works, Ltd. Hand-held hair dryer. 4,556,782, Cl. 219-370.000.

Fujita, Munehisa: *See—*
Tanemura, Hatsumi; Ukai, Toshinao; Okazaki, Masaki; Deguchi, Naoyasu; Fujita, Munehisa; and Yamamuro, Kiyohiko, 4,556,633, Cl. 430-573.000.

Fujita, Shinsaku: *See—*
Sato, Kozo; Fujita, Shinsaku; Nakamura, Koichi; and Naito, Hideki, 4,556,632, Cl. 430-562.000.

Fujitsu Limited: *See—*
Yoshikawa, Kazuo; Yamaguchi, Hisashi; and Asano, Toru, 4,556,871, Cl. 340-365.00C.

Fujiwara, Kunio: *See—*
Katoo, Hisashi; Fujiwara, Kunio; and Kawashima, Yoshikazu, 4,556,940, Cl. 364-424.000.

Fukagawa, Hitoshi; Suzuki, Yoshiharu; and Komoda, Yoshiyuki, to Matsushita Electric Works, Ltd. Data transmission system utilizing power line. 4,556,865, Cl. 340-310.00R.

Fukami, Akira; and Noguchi, Hiroki, to Nippon Soken, Inc. Heating system for automobiles with heat storage tank. 4,556,171, Cl. 237-12.30B.

Fukatsu, Shunzo: *See—*
Shibahara, Seiji; Okonogi, Tsuneo; Murai, Yasushi; Fukatsu, Shunzo; Niida, Taro; and Wakazawa, Tadashi, 4,556,513, Cl. 260-239.00A.

Fukuda, Hiroshi, to Fuji Photo Film Co., Ltd. Autofocus camera including a cover for a taking lens and diagonally disposed range finder windows. 4,556,304, Cl. 354-288.000.

Fukuda, Hiroshi: *See—*
Maki, Masao; Kaneko, Yasunori; and Fukuda, Hiroshi, 4,556,048, Cl. 126-417.000.

Fukui, Shiroh: *See—*
Nishigaki, Haruo; Watanabe, Koji; Fukui, Shiroh; and Kanematsu, Kiyoshi, 4,556,511, Cl. 252-573.000.

Fuller, Payton D.: *See—*
Hunter, Charles L.; Fuller, Payton D.; and Mutchler, David K., 4,556,484, Cl. 210-90.000.

Fulton Manufacturing Corporation: *See—*
Richter, Karl E.; and Ebey, Edward W., 4,556,233, Cl. 280-513.000.

Fulton, Raymond L., Jr.: *See—*
Schindler, Frederick J.; and Fulton, Raymond L., Jr., 4,556,701, Cl. 526-282.000.

Funada, Fumiaki; Matsura, Masataka; and Wada, Tomio, to Sharp Kabushiki Kaisha. Fluorescent liquid crystal display devices. 4,556,287, Cl. 350-336.000.

Furutachi, Nobuo; Nakamura, Kotaro; and Hirose, Takeshi, to Fuji Photo Film Co., Ltd. Color photographic light-sensitive material. 4,556,630, Cl. 430-372.000.

Futaba Denshi Kogyo K.K.: *See—*
Nakamura, Iwao, 4,555,840, Cl. 29-465.000.

Gachring, David P., to Campbell Soup Company. Process for preparing tomato products of increased consistency. 4,556,576, Cl. 426-615.000.

Gaeta, Federico C. A.: *See—*
Andrews, David R.; and Gaeta, Federico C. A., 4,556,655, Cl. 514-222.000.

Gagas, Michael S. Butterfly valve adaptor. 4,556,081, Cl. 137-366.000.

Gagliani, John; and Long, John V. Polyimide compositions and foams and methods of making same. 4,556,682, Cl. 521-185.000.

Gallaro, Carmelo. Water gas furnace. 4,555,993, Cl. 110-234.000.

Gang-Nail Systems, Inc.: *See—*
Rionda, Carlos S.; and Palacio, Joaquin J., 4,555,887, Cl. 52-712.000.

Gantzer, Mary Lou, to Miles Laboratories, Inc. Stabilized test composition, device and method for the determination of peroxidatively active substances. 4,556,640, Cl. 436-66.000.

Garrett Corporation, The: *See—*
Gersch, Herbert M.; and Brown, Glenn W., 4,556,528, Cl. 264-221.000.
Manatt, Scott A., 4,556,180, Cl. 244-135.00R.

Gartner, Fritz, to Josef Gartner & Co. Process for the installation of curtain walls and apparatus for the execution of the process. 4,555,890, Cl. 52-745.000.

Gartside, Robert J.; and Woebcke, Herman N., to Stone & Webster Engineering Corporation. Low residence time solid-gas separation device and system. 4,556,541, Cl. 422-145.000.

Gauert, Rolf; Rodloff, Rudiger K.; and Siol, Gerald H., to Deutsche Forschungs- und Versuchsanstalt fur Luft- und Raumfahrt e.V. Sensor of rotational velocity on the basis of a ring laser. 4,556,319, Cl. 356-350.000.

GCA Corporation: *See—*
Blechschmid, John; Coyne, Richard D.; Palmer, David; and Piatt, John A., 4,556,785. Cl. 219-460.000.

Geaghan, Bernard O.: *See—*
Caprio, A. Ronald; Cyr, John P.; Geaghan, Bernard O.; Kotschenreuther, Paul C.; Schanin, David J.; and Salett, Ronald M., 4,556,953, Cl. 364-900.000.

Gee, Mark G.: *See—*
Almond, Eric A.; and Gee, Mark G., 4,556,403, Cl. 51-308.000.

Gehr, Peter: *See—*
Nyfeler, Alex; Gehr, Peter; Stalder, Martin; and Antes, Gregor, 4,556,378, Cl. 425-143.000.

Gehrmann, Klaus: *See—*
Erpenbach, Heinz; Gehrmann, Klaus; Lork, Winfried; and Prinz, Peter, 4,556,644, Cl. 502-33.000.

Geiss, Vernon L.: *See—*
Gravely, Lawrence E.; Geiss, Vernon L.; and Gregory, Charles F., 4,556,073, Cl. 131-297.000.

Geka, Toshiaki, to Nippon Thompson Co, Ltd. Direction changing path of a roller bearing for an endless linear motion. 4,556,262, Cl. 308-6.00C.

Gemmill, Robert M., Jr.: *See—*
Horodysky, Andrew G.; and Gemmill, Robert M., Jr., 4,556,497, Cl. 252-51.50A.

General Electric Company: *See—*
Benson, Michael R.; and Hill, William D., 4,556,329, Cl. 374-173.000.
Curulla, Michael V., 4,556,531, Cl. 376-441.000.
Dickenson, Royston J.; and Jaswa, Vijay C., 4,556,956, Cl. 364-162.000.
Erdman, David M., 4,556,827, Cl. 318-254.000.
Liberti, Frank N.; and Macke, Gerald F., 4,556,681, Cl. 521-90.000.
Logan, James H., 4,556,857, Cl. 335-210.000.
Lohrey, Edwin J.; and Cho, Timothy C., 4,556,822, Cl. 315-67.000.
McCready, Russell J.; and Tyrell, John A., 4,556,688, Cl. 525-33.000.
McCready, Russell J., 4,556,705, Cl. 528-289.000.
Milkovic, Miran; and Bogacki, Anthony P., 4,556,843, Cl. 324-107.000.
Olson, Daniel R., 4,556,606, Cl. 428-412.000.
Rosenquist, Niles R., 4,556,704, Cl. 528-196.000.
Sargisson, Donald F.; and Toraason, Clifford M., Jr., 4,556,366, Cl. 416-155.000.
Thibault, William C.; and Fowler, Robert C., 4,556,612, Cl. 429-54.000.
Wakeman, Thomas G.; and Maclin, Harvey M., 4,555,901, Cl. 60-39.320.

General Electric Environmental Services, Inc.: *See—*
Kim, Bang M.; and Weininger, Joseph L., 4,556,469, Cl. 204-263.000.

General Foods Corporation: *See—*
Brander, Rita W.; Raap, Teresa A.; and Gessler, Joseph F., 4,556,569, Cl. 426-104.000.
Brander, Rita W.; Raap, Teresa A.; and Rankowitz, Marshall M., 4,556,570, Cl. 426-104.000.
Katz, Saul N.; and Kearney, Donald T., 4,556,575, Cl. 426-594.000.

General Motors Corporation: *See—*
Gutterman, Jeffrey S., 4,555,951, Cl. 73-861.280.
Hickling, Robert, 4,556,020, Cl. 123-143.00B.
Langmesser, Otto J., Jr.; Lock, Charles R.; and Wood, James C., 4,556,186, Cl. 248-429.000.

General Resource Corp.: *See—*
Pausch, Josef; and Sorenson, David A., 4,556,173, Cl. 239-533.130.

General Screw Products Company: *See—*
Nimberger, Spencer M., 4,556,196, Cl. 251-214.000.

Geneve, Francois M.; Heiligenstein, Luc M. D.; and Melamed, Stephen B., to Tres Design Co., Inc. Disposable chair. 4,556,253, Cl. 297-440.000.

Genies, Bernerd: *See—*
Laurenceau, Serge; Moufflet, Luc; and Genies, Bernerd, 4,556,384, Cl. 431-160.000.

Genrich, Thad J., to Motorola, Inc. Frequency multiplier/divider apparatus and method. 4,556,984, Cl. 377-47.000.

Genroku Corporation: *See—*
Egawa, Kinsho, 4,555,990, Cl. 108-20.000.

Georg Fischer Aktiengesellschaft: *See—*
Mahnig, Fritz; and Meister, Herbert, 4,556,234, Cl. 280-688.000.

Georg Spiess GmbH: *See—*
Marass, Josef; and Liepert, Rudolf, 4,555,989, Cl. 101-424.000.

George, Clifford L., to Xerox Corporation. High speed duplicator with copy sheet pre-loading receptacle. 4,556,210, Cl. 271-157.000.

George, David L. Electrical circuit identification means. 4,556,839, Cl. 324-66.000.

George, Richard E., to John Fluke Mfg. Co., Inc. Dual rate, integrating, analog-to-digital converter. 4,556,867, Cl. 340-347.0NT.

Georgii, Hans C. Buoyant plant especially for the off-shore manufacturing of concrete structures. 4,556,002, Cl. 114-264.000.

Gepner, Isadore: *See—*
Shaw, Arthur W.; and Gepner, Isadore, 4,556,765, Cl. 200-61.710.

Gerard, Jean-Louis: *See—*
Bricot, Claude; Berthet, Pierre; Mertz, Bruno; and Gerard, Jean-Louis, 4,556,966, Cl. 369-52.000.
Germaine Monteil Cosmetiques Corp.: *See—*
Calvo, Luis C., 4,556,554, Cl. 424-70.000.
Gersch, Herbert M.; and Brown, Glenn W., to Garrett Corporation, The. Mold and method for casting of fragile and complex shapes. 4,556,528, Cl. 264-221.000.
Gervasio, Vincenzo; and Rossi, Antonio, to Snamprogetti S.p.A. Method for utilizing wind energy for autonomous electricity production. 4,556,801, Cl. 290-44.000.
Gessler, Joseph F.: *See—*
Brander, Rita W.; Raap, Teresa A.; and Gessler, Joseph F., 4,556,569, Cl. 426-104.000.
Gewerkschaft Eisenhutte Westfalia: *See—*
Follert, Hans G.; Rzepka, Herbert; and Schwert, Martin, 4,556,256, Cl. 299-33.000.
Giani, Roberto; Parini, Ettore; and Tonon, Giancarlo, to Dompe' Farmaceutica S.p.A. Pyrido[1,5]benzodiazepinone derivatives and pharmacological activities thereof. 4,556,653, Cl. 514-220.000.
Giebel, Frank, to Ford Motor Company. Independent wheel suspension for non-steered wheels of motor vehicles. 4,556,235, Cl. 280-690.000.
Giebeler, Robert H., Jr.: *See—*
Vaguine, Victor A.; Giebeler, Robert H., Jr.; and McEuen, Albert H., 4,556,070, Cl. 128-804.000.
Gilbarco, Inc.: *See—*
Steger, James O., 4,556,927, Cl. 361-215.000.
Giles, Richard E.: *See—*
Wiesehahn, Gary P.; Giles, Richard E.; and Stevens, David R., 4,556,556, Cl. 424-89.000.
Ginter, Sally P.: *See—*
Pawloski, Chester E.; and Ginter, Sally P., 4,556,710, Cl. 544-214.000.
Ginzburg, Vladimir B., to Tippins Machinery Company, Inc. Adaptive strip wedge control for reversing mill. 4,555,922, Cl. 72-229.000.
Giocastro, James: *See—*
Giocastro, Joseph; Giocastro, Salvatore; and Giocastro, James, 4,556,023, Cl. 123-190.00A.
Giocastro, Joseph; Giocastro, Salvatore; and Giocastro, James. Rotary valves and gear timing. 4,556,023, Cl. 123-190.00A.
Giocastro, Salvatore: *See—*
Giocastro, Joseph; Giocastro, Salvatore; and Giocastro, James, 4,556,023, Cl. 123-190.00A.
GKSS-Forschungszentrum Geesthacht GmbH: *See—*
Timm, Hans; and Griesbach, Heinz, 4,556,488, Cl. 210-321.100.
Glaser, Roger M.: *See—*
Petrofsky, Jerrold S.; Glaser, Roger M.; Petrofsky, Steven H.; and Heaton, Harry H., III, 4,556,214, Cl. 272-117.000.
Glass, Alastair M.; and Liao, Paul F., to AT&T Bell Laboratories. Photodetector having a contoured, substantially periodic surface. 4,556,790, Cl. 250-211.00J.
Glater, Michael, to Supreme Automation Corporation. Single loop load/unload drive arrangement with latching push member for storage and retrieval system. 4,556,355, Cl. 414-280.000.
Gloss, Erwin; Lotterbach, Gerhard; Perenthaler, Egbert; Schenk, Manfred; Van Woudenberg, Jan F.; and Zucker, Udo, to Robert Bosch GmbH. Method of and device for controlling after-start enrichment of internal combustion engine. 4,556,036, Cl. 123-491.000.
Glova, David J., to Chevron Research Company. Refrigeration lubricating oil containing dialkyl sulfosuccinate. 4,556,496, Cl. 252-33.000.
GMFanuc Robotics Corporation: *See—*
Bartlett, Donald S.; Boback, John A.; and Powell, Thomas M., 4,556,361, Cl. 414-744.00A.
Goda, Koshiro: *See—*
Sunagawa, Makoto; Goda, Koshiro; Enomoto, Masao; and Sasaki, Akira, 4,556,514, Cl. 260-239.00A.
Goldenberg, Joseph; and Cooke, Joseph. Preformed, reinforced structural panels and method of making same. 4,555,888, Cl. 52-722.000.
Goldman, Stuart O., to ITT Corporation. Hand-off filter for cellular mobile radio. 4,556,760, Cl. 179-2.0EB.
Goldobin, Vladimir B.: *See—*
Baldenko, Dmitry F.; Vadetsky, Jury V.; Goldobin, Vladimir B.; Gusman, Moisei T.; Kochnev, Anatoly M.; Nikomarov, Samuil S.; and Semenets, Valery I., 4,556,398, Cl. 464-16.000.
Golinelli, Guido; and Dall'Aglio, Carlo, to Finike Italiana Marposs S.p.A. Electronic gauge with at least one movable arm and a retraction device. 4,555,855, Cl. 33-147.00K.
Gomibuchi, Reizo: *See—*
Tomibe, Shinji; Gomibuchi, Reizo; and Takahashi, Kiyofumi, 4,556,507, Cl. 252-518.000.
Good, Raymond H.: *See—*
Carbo, Adelaida; and Good, Raymond H., 4,556,498, Cl. 252-51.50R.
Goode, Richard L., to Innovative Hearing Corporation. Ear acoustical hearing aid. 4,556,122, Cl. 181-136.000.
Gore, Jacques: *See—*
Bluthe, Norbert; Falou, Armand S.; and Gore, Jacques, 4,556,742, Cl. 568-403.000.
Gorecki, James L., to Honeywell Inc. Power line carrier FSK data system. 4,556,866, Cl. 340-310.00A.
Goto, Hirofumi: *See—*
Shimizu, Osamu; Goto, Hirofumi; and Matsukawa, Fumio, 4,556,876, Cl. 340-713.000.
Gotoh, Ichisei: *See—*
Yamawaki, Satoshi; Sugihara, Atsushi; Kobayashi, Yasushi; Ishida, Hiroshi; Kuramasu, Yukio; and Gotoh, Ichisei, 4,556,165, Cl. 228-223.000.
Gottlieb, Robert G. Non-fogging bathroom mirror. 4,556,298, Cl. 350-588.000.
Goubaud, Michel. Roof ventilator. 4,555,982, Cl. 98-42.220.
Gourdine, Meredith C., to Energy Innovations, Inc. Method and apparatus for improved cooling of hot materials. 4,555,909, Cl. 62-64.000.
Grace, William G. Apparatus for straightening vehicle structural part. 4,555,927, Cl. 72-447.000.
Gradl, Reinhard; and Roszinski, Hilmar, to Hoechst Aktiengesellschaft. Process for purifying wet-processed phosphoric acid. 4,556,548, Cl. 423-321.00S.
Gramling, James T.: *See—*
Raney, Charles C.; and Gramling, James T., 4,555,968, Cl. 83-209.000.
Graphite Sales, Inc.: *See—*
Burmeister, Kevin L., 4,556,097, Cl. 164-137.000.
Grasselli, Robert K.: *See—*
Guttmann, Andrew T.; and Grasselli, Robert K., 4,556,731, Cl. 562-546.000.
Grassi, Gino; Cammilli, Leonardo; Alcidi, Luciano; and Marconi, Paolo, to Grassi, Gino. Cardiac stimulator with frequency self-regulation through the electrocardiographic T wave. 4,556,062, Cl. 128-419.0PG.
Gravely, Lawrence E.; Geiss, Vernon L.; and Gregory, Charles F., to Brown & Williamson Tobacco Corporation. Process for reduction of nitrate content of tobacco by microbial treatment. 4,556,073, Cl. 131-297.000.
Gray, George W.: *See—*
Carr, Neil; and Gray, George W., 4,556,745, Cl. 568-632.000.
Gray Tool Comany: *See—*
Bridges, Charles D., 4,556,076, Cl. 137-72.000.
Green, David T., to United States Surgical Corporation. Apparatus for ligation and division with fixed jaws. 4,556,058, Cl. 128-305.000.
Greenberger, William, to Hopp Press Inc., The. Shelf molding clip. 4,556,183, Cl. 248-221.400.
Gregory, Charles F.: *See—*
Gravely, Lawrence E.; Geiss, Vernon L.; and Gregory, Charles F., 4,556,073, Cl. 131-297.000.
Greschner, Johann; Schwerdt, Friedrich W.; and Trumpp, Hans J., to International Business Machines Corporation. Process for producing printed circuit boards with metallic conductor structures embedded in the insulating substrate. 4,556,628, Cl. 430-314.000.
Grethlein, Hans E.: *See—*
Converse, Alvin O.; and Grethlein, Hans E., 4,556,430, Cl. 127-36.000.
Griesbach, Heinz: *See—*
Timm, Hans; and Griesbach, Heinz, 4,556,488, Cl. 210-321.100.
Griffin, Brian W.: *See—*
Capaldi, Nicholas R.; and Griffin, Brian W., 4,555,946, Cl. 73-517.00B.
Griggs, Colin G.; and Lodge, Philip G., to British Petroleum Company p.l.c., The. Process for the production of ethanol and/or acetaldehyde by the metal catalysed liquid phase reaction of methanol, carbon monoxide and hydrogen in the presence of a solvent. 4,556,744, Cl. 568-487.000.
Grillo, Susan M.: *See—*
Porter, Stuart C.; Woznicki, Edward J.; Grillo, Susan M.; and D'Andrea, Louis F., 4,556,552, Cl. 424-32.000.
Grohe, Klaus; Petersen, Uwe; Zeiler, Hans-Joachim; and Metzger, Karl G., to Bayer Aktiengesellschaft. 7-Amino-1-cyclopropyl-6,8-difluoro-1,4-dihydro-4-oxo-quinoline-3-carboxylic acids and antibacterial agents containing these compounds. 4,556,658, Cl. 514-254.000.
Grohe, Klaus; Zeiler, Hans-Joachim; and Metzger, Karl G., to Bayer Aktiengesellschaft. 2-Amino-8-cyclopropyl-5-oxo-5,8-dihydropyrido[2,3-d]-pyrimidine-6-carboxylic acid compounds. 4,556,709, Cl. 544-117.000.
Grossbard, Henry. Step-cut stone which has been brilliantized. 4,555,916, Cl. 63-32.000.
Grovalet, Yves: *See—*
Bordet, Rene ; Grovalet, Yves; Caudron, Lionel; and Diver, Marius, 4,555,881, Cl. 52-167.000.
Gruber, Robert J.; Koch, Ronald J.; Knapp, John F.; and Bolte, Steven B., to Xerox Corporation. Toner compositions with crosslinked resins and low molecular weight wax components. 4,556,624, Cl. 430-110.000.
Gruenwald, Mark J., to Clearwater Technologies Inc. Carrying handle assembly for a diving tank. 4,556,245, Cl. 294-31.200.
GTE Products Corporation: *See—*
Anderton, John J., 4,556,206, Cl. 269-16.000.
Anderton, John J., 4,556,281, Cl. 350-96.200.
Gundlach, Robert W.; Schwarz, William M., Jr.; and Gunther, Kenneth W., to Xerox Corporation. Screened donor for touchdown development. 4,556,013, Cl. 118-624.000.
Gunkel, Louis T.; and Juelke, Charles V., to FMC Corporation. Flame retardant styrene modified polyphenylene ether resins. 4,556,684, Cl. 524-141.000.
Gunther, Kenneth W.: *See—*
Gundlach, Robert W.; Schwarz, William M., Jr.; and Gunther, Kenneth W., 4,556,013, Cl. 118-624.000.
Gusman, Moisei T.: *See—*
Baldenko, Dmitry F.; Vadetsky, Jury V.; Goldobin, Vladimir B.; Gusman, Moisei T.; Kochnev, Anatoly M.; Nikomarov, Samuil S.; and Semenets, Valery I., 4,556,398, Cl. 464-16.000.

Gustav Mueller GmbH und Co. KG: *See—*
Muller, Rolf, 4,556,052, Cl. 128-11.000.

Gutterman, Jeffrey S., to General Motors Corporation. Reflective acoustic fluid flow meter. 4,555,951, Cl. 73-861.280.

Guttmann, Andrew T.; and Grasselli, Robert K., to Standard Oil Company, The. Process for the oxidation of olefins using catalysts containing various promoter elements. 4,556,731, Cl. 562-546.000.

Gwin, Richard B.; and Manning, Philip H., to Babcock & Wilcox Company, The. Weld backup mechanism for internal pipe welding apparatus. 4,556,162, Cl. 228-50.000.

Gzym, Larry P.; Ritzema, Lloyd G.; and Haadsma, David K., Jr., to Stow & Davis Furniture Company. Adjustable base for office landscaping system. 4,555,880, Cl. 52-126.400.

Haadsma, David K., Jr.: *See—*
Gzym, Larry P.; Ritzema, Lloyd G.; and Haadsma, David K., Jr., 4,555,880, Cl. 52-126.400.

Hachino, Hiroaki: *See—*
Kurihara, Yasutoshi; Suzuki, Yoshihiro; Ooue, Michio; Hachino, Hiroaki; and Yanagi, Mitsuo, 4,556,899, Cl. 357-80.000.

Hader, Helmut. Dental attachment for fixing dental prostheses. 4,556,388, Cl. 433-181.000.

Hagedorn, Alfred A., III: *See—*
Erhardt, Paul W.; Hagedorn, Alfred A., III; Lumma, William C., Jr.; and Wohl, Ronald A., 4,556,665, Cl. 514-338.000.

Hagino, Hiroyasu, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor device. 4,556,898, Cl. 357-71.000.

Hakko Co., Ltd.: *See—*
Kamuro, Takashi; Ootsuga, Hisao; Saito, Isao; and Koga, Motoyuki, 4,556,580, Cl. 427-8.000.

Hakusan Seisakusho Co., Ltd.: *See—*
Oishibashi, Hirotsugu; Ueyama, Katsuyoshi; Ohara, Muneyuki; Nakamura, Mitsuo; Aichi, Takeo; and Sasaki, Shigeru, 4,556,164, Cl. 228-199.000.

Halberstadt, Alex L.: *See—*
Frost, Kenneth S.; Halberstadt, Alex L.; and Letchford, John A., 4,556,786, Cl. 219-464.000.

Haldeman, Charles W., to Megatech Corporation. Wavy tube heat pumping. 4,556,101, Cl. 165-45.000.

Hall, Allen L.: *See—*
Fayter, Richard G., Jr.; and Hall, Allen L., 4,556,409, Cl. 71-76.000.

Halling, Vaughn W.: *See—*
Rinehart, Thomas A.; Willson, Richard F.; and Halling, Vaughn W., 4,556,893, Cl. 346-135.100.

Hamada, Tatsuzo, to Hitachi, Ltd. Liquid crystal display apparatus. 4,556,880, Cl. 340-814.000.

Hamada, Toshimitsu: *See—*
Kuni, Asahiro; Hamada, Toshimitsu; Makihira, Hiroshi; and Yoshimura, Kazushi, 4,556,797, Cl. 250-492.200.

Hamaide, Thierry: *See—*
le Mehaute, Alain; Hamaide, Thierry; Crepy, Gilles; and Marcellin, Georges, 4,556,614, Cl. 429-191.000.

Hamamatsu TV Co., Ltd.: *See—*
Hiruma, Teruo; Honma, Atsushi; Hirano, Tooru; Tsuchiya, Yutaka; Hayata, Yoshihiro; Aizawa, Katsuo; Kato, Harubumi; and Kainuma, Keiji, 4,556,057, Cl. 128-303.100.

Hamsher, Wilbur A., Jr., to AMP Incorporated. Electrical panelboard connector. 4,556,275, Cl. 339-218.00M.

Hanak, Joseph J., to RCA Corporation. Amorphous silicon cell array powered solar tracking apparatus. 4,556,788, Cl. 250-203.00R.

Hancock, Kendal, to Texas Recreation Corporation. Apparatus for making water skis. 4,556,375, Cl. 425-127.000.

Hans S. Singer Co., Inc.: *See—*
Singer, Hans S., 4,556,178, Cl. 242-130.000.

Hansen, David M., to Penn Engineering & Manufacturing Corp. Press having a leveraged linkage assembly mechanism. 4,555,928, Cl. 72-451.000.

Hansen, Hans-Jurgen; and Schmid, Rudolf, to Hoffmann-La Roche Inc. Phosphorus compounds. 4,556,740, Cl. 568-13.000.

Hanson, Richard A.; and Foote, Steven A., to Sundstrand Data Control, Inc. Method and apparatus for producing a controlled preload on a transducer assembly. 4,555,944, Cl. 73-517.00B.

Hanson, Richard A., to Sundstrand Data Control, Inc. Method and apparatus for producing a controlled preload on a transducer assembly by means of a composite material sleeve. 4,555,945, Cl. 73-517.00B.

Hara, Yoshio: *See—*
Sato, Susumu; and Hara, Yoshio, 4,556,631, Cl. 430-498.000.

Harada, Kosuke; Murata, Katsuaki; and Nakamizo, Takazi, to Nishimu Electronics Industries, Co., Ltd. Uninterruptible ac power supply. 4,556,802, Cl. 307-66.000.

Harbert, Charles A.: *See—*
Welch, Willard M., Jr.; Harbert, Charles A.; Koe, B. Kenneth; and Kraska, Allen R., 4,556,676, Cl. 514-554.000.

Harer, Helmut: *See—*
Beisse, Achim; Harer, Helmut; Mohr, Adolf; and Schustek, Siegfried, 4,556,809, Cl. 310-114.000.

Hargest, Thomas S., III. Patient evacuation system from a multistory structure. 4,556,123, Cl. 182-36.000.

Harlan, Burton C. Portable hoist. 4,556,358, Cl. 414-550.000.

Harle, Hans G., to Siemens Aktiengesellschaft. CMI Decoder. 4,556,868, Cl. 340-347.0DD.

Harley-Davidson Motor Co., Inc.: *See—*
Anklam, Bruno; Koenneker, Reinhard; and Mezger, Hans, 4,556,034, Cl. 123-470.000.

Harrington, Robert E. Waste line trap. 4,555,818, Cl. 4-191.000.

Harris, Alton C.: *See—*
James, Benny R., 4,555,841, Cl. 29-468.000.

Harris Graphics Corporation: *See—*
Campbell, Roscoe, 4,556,208, Cl. 270-52.000.

Harris, Stephen J.; McKervey, M. Anthony; Melody, David P.; Woods, John; and Rooney, John M., to Loctite Limited. Instant adhesive composition utilizing calixarene accelerators. 4,556,700, Cl. 526-209.000.

Harris, Victor A., to Hersham Valves Ltd. Exhaust braking system for an internal combustion engine. 4,556,027, Cl. 123-323.000.

Hartung, Hansjurgen, to Rollei Fototechnic GmbH. Attachment cassette for a roll film cassette-type photographic camera. 4,556,301, Cl. 352-78.00R.

Haruhisa, Tamura: *See—*
Yoshiyuki, Takada; and Haruhisa, Tamura, 4,556,773, Cl. 219-10.55C.

Harvey, Bruce J.: *See—*
Pauwels, Michael A.; Wright, Danny O.; and Harvey, Bruce J., 4,556,943, Cl. 364-431.120.

Hasegawa, Yoshio: *See—*
Yajima, Seishi; Okamura, Kiyohito; Hasegawa, Yoshio; and Yamamura, Takemi, 4,556,526, Cl. 264-60.000.

Hashimoto Corporation: *See—*
Hashimoto, Kazuo, 4,556,761, Cl. 179-6.050.

Hashimoto, Kaoru; and Nagata, Kenzo, to Minolta Camera Kabushiki Kaisha. Temperature control arrangement for heat roller. 4,556,779, Cl. 219-216.000.

Hashimoto, Kazuo, to Hashimoto Corporation. Automatic telephone answering apparatus. 4,556,761, Cl. 179-6.050.

Haslanger, Martin F.: *See—*
Snitman, David L.; Haslanger, Martin F.; and Sprague, Peter W., 4,556,675, Cl. 514-469.000.

Hasler, Rudolf, to U.S. Philips Corporation. Tuner. 4,556,990, Cl. 455-333.000.

Hata, Hitoshi: *See—*
Tsubouchi, Toshiyuki; and Hata, Hitoshi, 4,556,503, Cl. 252-73.000.

Hattori, Tadashi: *See—*
Sato, Susumu; Hattori, Tadashi; Ueno, Yoshiki; and Taguchi, Takashi, 4,556,599, Cl. 428-216.000.

Hattori, Yoshiyuki: *See—*
Watanabe, Kiyohiko; Hattori, Yoshiyuki; Nakamura, Toshiaki; and Ohnishi, Shunsaku, 4,556,363, Cl. 415-53.00T.

Haught, David E.: *See—*
Blitchington, Frank H.; and Haught, David E., 4,556,903, Cl. 358-106.000.

Hauni-Werke Korber & Co. KG: *See—*
Hoffmann, Gottfried, 4,556,071, Cl. 131-84.400.

Hawkins, Phillip J.; and Choby, Edward J., to Westinghouse Electric Corp. Mechanical plug drill. 4,555,833, Cl. 29-33.00T.

Haworth, Willis C.: *See—*
Agsten, Carl F.; and Haworth, Willis C., 4,555,883, Cl. 52-245.000.

Hayakawa, Tomohiko: *See—*
Atsumi, Haruo; Iwakiri, Norio; Kiyono, Yasuhiro; and Hayakawa, Tomohiko, 4,556,768, Cl. 200-302.200.

Hayata, Yoshihiro: *See—*
Hiruma, Teruo; Honma, Atsushi; Hirano, Tooru; Tsuchiya, Yutaka; Hayata, Yoshihiro; Aizawa, Katsuo; Kato, Harubumi; and Kainuma, Keiji, 4,556,057, Cl. 128-303.100.

Hayes, Gerald E.: *See—*
Advani, Hira; and Hayes, Gerald E., 4,556,954, Cl. 364-900.000.

Hazbun, Edward A., to Atlantic Richfield Company. Catalytic conversion of olefins to higher hydrocarbons. 4,556,749, Cl. 585-330.000.

Hazen Research, Inc.: *See—*
Reynolds, James E.; and Williams, Alan R., 4,556,422, Cl. 75-101.00R.

Hazue, Masaaki: *See—*
Murakami, Yoshiaki; Shiba, Kunio; Yoshitake, Akira; Takahashi, Keietsu; Ueda, Nobuo; and Hazue, Masaaki, 4,556,689, Cl. 525-54.100.

Heaton, Harry H., III: *See—*
Petrofsky, Jerrold S.; Glaser, Roger M.; Petrofsky, Steven H.; and Heaton, Harry H., III, 4,556,214, Cl. 272-117.000.

Heaton, William C., to Howell, Ronald P., a part interest. Internal combustion turbine engine. 4,555,903, Cl. 60-595.000.

Hegar, Gert; and Seiler, Herbert, to Ciba Geigy Corporation. Heavy metal-containing formazane dyes containing a fiber-reactive fluorotriazine group. 4,556,706, Cl. 534-618.000.

Hegedus, Bela; Balint, Sandor; Hudak, Janos; Barta, Gyorgy; and Aszlanyi, Jozsef, to "Oktober 6" Mezogazdasagi Termeloszovetkezet. Method and device for low energy consumption or granular products or the like containing moisture fixed or deposited at the surface with a constant yield. 4,555,858, Cl. 34-25.000.

Heier, Karl H.; Bohm, Roland; and Hobes, John V., to Hoechst Aktiengesellschaft. Process for improving the flow properties of mineral oils. 4,556,499, Cl. 252-51.50A.

Heiligenstein, Luc M. D.: *See—*
Geneve, Francois M.; Heiligenstein, Luc M. D.; and Melamed, Stephen B., 4,556,253, Cl. 297-440.000.

Heilmann, Steven M.; Krepski, Larry R.; and Rasmussen, Jerald K., to Minnesota Mining and Manufacturing Company. Process for the production of acyloins. 4,556,723, Cl. 556-413.000.

Heinrich, Peter: *See—*
Knop, Klaus; and Heinrich, Peter, 4,556,421, Cl. 75-91.000.

Heitmann, Jurgen; and Rickenbrock, Horst, to Robert Bosch GmbH. Method and apparatus for pre-emphasis counteraction of variations in

amplitude of received or reproduced serial binary signals. 4,556,983, Cl. 375-60.000.
Helix Technology Corporation: *See—*
Bartlett, Allen J., 4,555,907, Cl. 62-55.500.
Hendricks, Howard F., to Electric Indicator Company, Inc. Coil unit and coil form for electrical machines. 4,556,811, Cl. 310-266.000.
Hendriock, Hans-Jurgen: *See—*
Neumann, Wolfgang; Hendriock, Hans-Jurgen; and Fitz, Herbert, 4,556,589, Cl. 428-35.000.
Henk, Hermann, to Bayer Aktiengesellschaft. Triazole-group-containing disazo reactive dyestuff. 4,556,707, Cl. 534-635.000.
Henninger, Paul J.: *See—*
Doorley, Richard B.; Henninger, Paul J.; Klages, Chester F., Jr.; and Shetter, Jerrold K., 4,556,127, Cl. 184-3.100.
Henrick, Clive A.: *See—*
Lee, Shy-Fuh; and Henrick, Clive A., 4,556,520, Cl. 260-951.000.
Hens, Jozef F.: *See—*
Janssens, Frans E.; Torremans, Joseph L. G.; Hens, Jozef F.; and Van Offenwert, Theophilus T. J. M., 4,556,660, Cl. 514-272.000.
Hepher, Nicholas M., to Blue Circle Industries plc. Apparatus for separating particulate materials. 4,556,481, Cl. 209-127.000.
Herchenbach, Horst: *See—*
Wolter, Albrecht; and Herchenbach, Horst, 4,556,428, Cl. 106-102.000.
Hercules Incorporated: *See—*
Holsopple, Peggy S., 4,556,510, Cl. 252-547.000.
Herion-Werke KG: *See—*
Motzer, Helmut, 4,555,977, Cl. 91-446.000.
Hermanson, Herman A.; and Fisher, Almon P., to Xerox Corporation. Cleaning apparatus for a magnetographic recording head. 4,556,890, Cl. 346-74.400.
Herrmann, Christoph: *See—*
Kampf, Wolfgang; and Herrmann, Christoph, 4,556,754, Cl. 585-664.000.
Hersham Valves Ltd.: *See—*
Harris, Victor A., 4,556,027, Cl. 123-323.000.
Hershberger, Bernard J.: *See—*
McCammon, Patrick R.; Blackburn, Louis W.; and Hershberger, Bernard J., 4,556,772, Cl. 219-10.55F.
Hertz, Dominique: *See—*
Hintermann, Hans E.; and Hertz, Dominique, 4,556,098, Cl. 164-316.000.
Heyke, Klaus, to Robert Bosch GmbH. Distributorless ignition system for multi-cylinder internal combustion engine with misfire suppression. 4,556,040, Cl. 123-643.000.
Heyne, Carl J., to Westinghouse Electric Corp. Electromagnetic launcher with powder driven projectile insertion. 4,555,972, Cl. 89-8.000.
Hickling, Robert, to General Motors Corporation. Method and means for stimulating combustion especially of lean mixtures in internal combustion engines. 4,556,020, Cl. 123-143.00B.
Higashi, Robert E.: *See—*
Bohrer, Philip J.; Higashi, Robert E.; Johnson, Timothy L.; and Satren, Ernest A., 4,555,939, Cl. 73-198.000.
Higuchi, Matsuo: *See—*
Kamijo, Eiji; and Higuchi, Matsuo, 4,556,416, Cl. 75-0.50B.
Hilden, Leif A.: *See—*
Andersen, Lars H.; and Hilden, Leif A., 4,556,673, Cl. 514-414.000.
Hill, Walter A.: *See—*
Schwalm, Charles L.; and Hill, Walter A., 4,556,830, Cl. 318-326.000.
Hill, William D.: *See—*
Benson, Michael R.; and Hill, William D., 4,556,329, Cl. 374-173.000.
Hines, Gordon E.; and Kerlin, Jack H., to Hines Industries, Inc. Drill press mounting apparatus for balancing machine. 4,556,346, Cl. 408-88.000.
Hines Industries, Inc.: *See—*
Hines, Gordon E.; and Kerlin, Jack H., 4,556,346, Cl. 408-88.000.
Hines, John E.: *See—*
Deering, Roland F.; Hines, John E.; and Dhondt, Roland O., deceased, 4,556,458, Cl. 202-227.000.
Hintermann, Hans E.; and Hertz, Dominique, to Laboratoire Suisse de Recherches Horlogeres. Hot chamber die casting of aluminum and its alloys. 4,556,098, Cl. 164-316.000.
Hirai, Tadaaki: *See—*
Imamura, Yoshinori; Ataka, Saburo; Takasaki, Yukio; Tanaka, Yasuo; Hirai, Tadaaki; and Maruyama, Eiichi, 4,556,816, Cl. 313-366.000.
Kusano, Chushirou; Ishioka, Sachio; Imamura, Yoshinori; Takasaki, Yukio; Ogawa, Hirofumi; Makishima, Tatsuo; Hirai, Tadaaki; and Maruyama, Eiichi, 4,556,817, Cl. 313-371.000.
Hiramatsu, Yukio, to Litton Systems, Inc. Microwave window and matching structure. 4,556,854, Cl. 333-34.000.
Hiraro, Tooru: *See—*
Hiruma, Teruo; Honma, Atsushi; Hirano, Tooru; Tsuchiya, Yutaka; Hayata, Yoshihiro; Aizawa, Katsuo; Kato, Harubumi; and Kainuma, Keiji, 4,556,057, Cl. 128-303.100.
Hirasawa, Yoji; and Ikeda, Shoji, to Nippon Paint Co., Ltd. Pigment dispersing resin and composition containing same. 4,556,683, Cl. 523-447.000.
Hirose, Takeshi: *See—*
Furutachi, Nobuo; Nakamura, Kotaro; and Hirose, Takeshi, 4,556,630, Cl. 430-372.000.
Hirsch, Martin: *See—*
Rudolph, Paul; and Hirsch, Martin, 4,556,402, Cl. 48-197.00R.
Hiruma, Teruo; Honma, Atsushi; Hirano, Tooru; Tsuchiya, Yutaka; Hayata, Yoshihiro; Aizawa, Katsuo; Kato, Harubumi; and Kainuma, Keiji, to Hamamatsu TV Co., Ltd. Cancer diagnosis device utilizing laser beam pulses. 4,556,057, Cl. 128-303.100.
Hitachi Denshi Kabushiki Kaisha: *See—*
Matsuoka, Hironao; and Suzuka, Kazuo, 4,556,989, Cl. 455-183.000.
Hitachi Keiyo Engineering Co., Ltd.: *See—*
Sarugaku, Shinichi; Tsuchihashi, Akira; and Tsuji, Masao, 4,556,777, Cl. 219-124.340.
Hitachi Koki Company, Limited: *See—*
Sakamoto, Junshin; and Shinohara, Shigeru, 4,556,831, Cl. 318-434.000.
Hitachi, Ltd.: *See—*
Hamada, Tatsuzo, 4,556,880, Cl. 340-814.000.
Imaide, Takuya; Masuda, Michio; Okuda, Akihide; and Nishimura, Ryuji, 4,556,911, Cl. 358-212.000.
Imamura, Yoshinori; Ataka, Saburo; Takasaki, Yukio; Tanaka, Yasuo; Hirai, Tadaaki; and Maruyama, Eiichi, 4,556,816, Cl. 313-366.000.
Imura, Ryo; Ikeda, Tadashi; Takeuchi, Teruaki; Umezaki, Hiroshi; Suzuki, Ryo; and Sugita, Yutaka, 4,556,582, Cl. 427-38.000.
Imura, Ryo; Ikeda, Tadashi; Takeuchi, Teruaki; Ohta, Norio; and Sugita, Yutaka, 4,556,583, Cl. 427-38.000.
Kuni, Asahiro; Hamada, Toshimitsu; Makihira, Hiroshi; and Yoshimura, Kazushi, 4,556,797, Cl. 250-492.200.
Kurihara, Yasutoshi; Suzuki, Yoshihiro; Ooue, Michio; Hachino, Hiroaki; and Yanagi, Mitsuo, 4,556,899, Cl. 357-80.000.
Kusano, Chushirou; Ishioka, Sachio; Imamura, Yoshinori; Takasaki Yukio; Ogawa, Hirofumi; Makishima, Tatsuo; Hirai, Tadaaki; and Maruyama, Eiichi, 4,556,817, Cl. 313-371.000.
Ohta, Hisao; Baji, Toru; Izawa, Yuji; Ebisui, Eizou; Tsukada, Toshihisa; and Yamamoto, Hideaki, 4,556,800, Cl. 250-578.000.
Sarugaku, Shinichi; Tsuchihashi, Akira; and Tsuji, Masao, 4,556,777, Cl. 219-124.340.
Shibata, Akira; and Komatsu, Keiichi, 4,556,917, Cl. 358-343.000.
Suenaga, Masahide; Chida, Kousaku; and Ohura, Masaki, 4,556,925, Cl. 360-113.000.
Tsunoda, Yoshito; Miyauchi, Toshimitsu; and Shigematsu, Kazuo, 4,556,965, Cl. 369-45.000.
Yamada, Kazuji; Sato, Hideo; Kato, Kazuo; Sasayama, Takao; Kawakami, Kanji; and Kanzawa, Ryosaku, 4,556,807, Cl. 307-491.000.
Hitachi Maxell Ltd.: *See—*
Takagi, Hiroyoshi; Amaike, Toshiyuki; and Mizutani, Hikaru, 4,556,153, Cl. 220-334.000.
Hitzman, Donald O.; and Hopkins, Thomas R., to Phillips Petroleum Company. Determination of alcohol content in wate. imiscible organic systems. 4,556,635, Cl. 435-25.000.
Hobbs Bonded Fibers: *See—*
Baigas, Joseph F., Jr., 4,556,521, Cl. 261-94.000.
Hobes, John V.: *See—*
Heier, Karl H.; Bohm, Roland; and Hobes, John V., 4,556,499, Cl. 252-51.50A.
Hodges, John B.: *See—*
Morgan, Paul W.; Ellwood, Thomas J.; Amlani, Kish D.; and Hodges, John B., 4,555,955, Cl. 73-862.060.
Hodgson, Darel E.; and Krumme, John F. Artificial sphincter including a shape memory member. 4,556,050, Cl. 128-1.00R.
Hoechst Aktiengesellschaft: *See—*
Andrae, Klaus; Bytzek, Max; Hutschenreuter, Elfried; and Lang, Hans U., 4,556,708, Cl. 536-57.000.
Erckel, Rudiger; Franz, Raimund; Woernle, Rolf; and Riehm, Theodor, 4,556,431, Cl. 127-37.000.
Erckel, Rudiger; Franz, Raimund; Woernle, Rolf; and Riehm, Theodor, 4,556,432, Cl. 127-37.000.
Erpenbach, Heinz; Gehrmann, Klaus; Lork, Winfried; and Prinz, Peter, 4,556,644, Cl. 502-33.000.
Gradl, Reinhard; and Roszinski, Hilmar, 4,556,548, Cl. 423-321.00S.
Heier, Karl H.; Bohm, Roland; and Hobes, John V., 4,556,499, Cl. 252-51.50A.
Neumann, Wolfgang; Hendriock, Hans-Jurgen; and Fitz, Herbert, 4,556,589, Cl. 428-35.000.
Hoenmanns, Wilhelm: *See—*
Reth, Erich; and Hoenmanns, Wilhelm, 4,555,923, Cl. 72-250.000.
Hoffman, William P. Two-in-one quick release cane. 4,556,075, Cl. 135-65.000.
Hoffmann, George T. Robotic apparatus. 4,556,360, Cl. 414-701.000.
Hoffmann, Gerhard; and Neumann, Peter, to BASF Aktiengesellschaft. Electrophotographic recording material containing a metal-1,3-diketone complex. 4,556,621, Cl. 430-49.000.
Hoffmann, Gerhard: *See—*
Neumann, Peter; Etzbach, Karl-Heinz; and Hoffmann, Gerhard, 4,556,622, Cl. 430-58.000.
Hoffmann, Gottfried, to Hauni-Werke Korber & Co. KG. Method and apparatus for forming rod-shaped articles of the tobacco processing industry. 4,556,071, Cl. 131-84.400.
Hoffmann, Heiner, to Ingeborg Niess Elektromedizinischee Apparate. Electrode structure for electric contactor. 4,556,065, Cl. 128-639.000.
Hoffmann-La Roche Inc.: *See—*
Dorn, Franz; Montavon, Francois; and Suchy, Milos, 4,556,661, Cl. 514-277.000.
Frater, Georg; Suchy, Milos; Wenger, Jean; and Winternitz, Paul, 4,556,413, Cl. 71-94.000.
Hansen, Hans-Jurgen; and Schmid, Rudolf, 4,556,740, Cl. 568-13.000.
Lucci, Robert, 4,556,518, Cl. 260-413.000.

Hoffmeister, Lawrence D.; and Thompson, Richard J., to United States of America, Army. Lightweight composite launcher pod production process. 4,556,438, Cl. 156-79.000.

Hoglund, Ingolf, to AB Mecman. Sealing device for a pressure fluid cylinder without piston rod. 4,555,980, Cl. 92-88.000.

Hokanson, D. Eugene; and Arneson, Dennis C., to D. E. Hokanson, Inc. Bandwidth indicator for Doppler blood flowmeters. 4,556,067, Cl. 128-663.000.

Hoke, Arthur J.: *See*—
McKinnon, Greg E. J.; and Hoke, Arthur J., 4,555,870, Cl. 49-462.000.

Holik, Herbert: *See*—
Dahl, Hans; Holik, Herbert; Kurtz, Rudiger; and Stotz, Wolf-Gunter, 4,556,454, Cl. 162-358.000.

Holland, Thomas L.: *See*—
Tsang, Albert C.; Holland, Thomas L.; and Masey, Johnny W., 4,556,748, Cl. 568-858.000.

Holmes, Wendell: *See*—
Dansie, Ryan F.; Holmes, Wendell; and Baird, Denzil B., 4,556,199, Cl. 254-348.000.

Holsopple, Peggy S., to Hercules Incorporated. Transparent liquid shower soap. 4,556,510, Cl. 252-547.000.

Homeyer, Bernhard: *See*—
Salzburg, Herbert; Fauss, Rudolf; Findeisen, Kurt; and Homeyer, Bernhard, 4,556,649, Cl. 514-63.000.

Honda Giken Kogyo Kabushiki Kaisha: *See*—
Shiratsuchi, Kouji, 4,556,119, Cl. 180-219.000.

Honda, Kazumi: *See*—
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Honeywell Inc.: *See*—
Bohrer, Philip J.; Higashi, Robert E.; Johnson, Timothy L.; and Satren, Ernest A., 4,555,939, Cl. 73-198.000.
Gorecki, James L., 4,556,866, Cl. 340-310.00A.
Kozlik, Tony J., 4,556,974, Cl. 370-89.000.
Read, Edgar L., 4,556,939, Cl. 364-200.000.
Zervos, Daniel H., 4,556,169, Cl. 236-49.000.

Honeywell Information Systems Inc.: *See*—
Russell, Robert J., 4,556,840, Cl. 324-73.00R.

Hong, Sun-nan: *See*—
Spector, Marshall L.; Hong, Sun-nan; and Seebohm, Robert P., 4,556,491, Cl. 210-608.000.

Hongo, Yasuo, to Fuji Electric Company, Inc. Pattern recognition apparatus. 4,556,985, Cl. 382-30.000.

Honma, Atsushi: *See*—
Hiruma, Teruo; Honma, Atsushi; Hirano, Tooru; Tsuchiya, Yutaka; Hayata, Yoshihiro; Aizawa, Katsuo; Kato, Harubumi; and Kainuma, Keiji, 4,556,057, Cl. 128-303.100.

Honma, Junji, to Idemitsu Kosan Company Limited. Reactor. 4,556,537, Cl. 422-49.000.

Hood, Charles F.: *See*—
Fathauer, George H.; and Hood, Charles F., 4,555,941, Cl. 73-304.00C.

Hopkins, Melvyn D.: *See*—
Bolin, Philip C.; Bowman, Gary K.; Ellis, Charles S.; Hopkins, Melvyn D.; and Kane, Richard E., 4,556,755, Cl. 174-21.00C.

Hopkins, Thomas R.: *See*—
Hitzman, Donald O.; and Hopkins, Thomas R., 4,556,635, Cl. 435-25.000.

Hopp Press Inc., The: *See*—
Greenberger, William, 4,556,183, Cl. 248-221.400.

Hopper, Steven P.: *See*—
Kanner, Bernard; Quirk, Jennifer M.; De Monte, Arthur P.; and Hopper, Steven P., 4,556,725, Cl. 556-442.000.

Hoppner, Werner F.; and Landefeld, James A., to Xerox Corporation. Removable processing cartridge for electrostatographic reproducing apparatus. 4,556,308, Cl. 355-3.00R.

Hori, Mikio: *See*—
Koda, Akihide; Hori, Mikio; Matsuura, Naosuke; Yasumoto, Mitsugi; Yamawaki, Ichiro; Ueda, Shuichi; and Tada, Yukio, 4,556,737, Cl. 564-218.000.

Horiba, Ltd.: *See*—
Amimoto, Hiroyuki; and Kohsaka, Hiroji, 4,555,931, Cl. 73-23.000.
Kohno, Takeshi; and Usui, Seiji, 4,556,473, Cl. 204-409.000.

Horie, Motonobu; Suzuki, Minoru; and Ogura, Shinji, to Japan Tobacco & Salt Public Corporation, The. Cigarette reversing apparatus. 4,556,072, Cl. 131-282.000.

Horodysky, Andrew G.; and Gemmill, Robert M., Jr., to Mobil Oil Corporation. N-Alkoxyalkylenediamine diamides and lubricants containing same. 4,556,497, Cl. 252-51.50A.

Horvath, Gabor: *See*—
Pongor nee Csakvari, Marianna; Nagy, Gabor; Horvath, Gabor; David nee Kenez, Maria; Bozsoky, Sandor; Virag, Sandor; and Marmarosi nee Kellner, Katalin, 4,556,563, Cl. 514-258.000.

Horvath, Stanley K., to Ford Motor Company. Stable crosslinked dispersion. 4,556,686, Cl. 524-315.000.

Hosaka, Yukihiro: *See*—
Kanto, Noriharu; Hosaka, Yukihiro; Sasaki, Yoshio; Kuramoto, Tatsuo; and Kimura, Masato, 4,555,914, Cl. 62-380.000.

Hoshizaki Electric Co., Ltd.: *See*—
Ishiguro, Fumio, 4,555,913, Cl. 62-347.000.

Hosiden Electronics Co., Ltd.: *See*—
Tanaka, Masanori, 4,556,264, Cl. 339-17.0LC.

Hostetler, John E.: *See*—
Sears, I. Weir; Hostetler, John E.; and Hulsebusch, William H., 4,555,814, Cl. 2-227.000.

Hottinger Baldwin Measurement, Inc.: *See*—
Lockery, Harry E.; and Freymiller, Edward, 4,556,115, Cl. 177-211.000.

Howarth, James, to International Computers Limited. Checking sequential logic circuits. 4,556,976, Cl. 371-25.000.

Howarth, Thomas T.: *See*—
Cole, Martin; Howarth, Thomas T.; and Reading, Christopher, 4,556,559, Cl. 424-114.000.

Howell, Ronald P.: *See*—
Heaton, William C., 4,555,903, Cl. 60-595.000.

Howells, Anthony P. S.; Dienglewicz, Anthony M.; Viswanathan, Raman; and Angehrn, Jorg A., to Dresser Industries, Inc. Depth dependent multiple logging system. 4,556,884, Cl. 340-860.000.

Howells, Richard D.: *See*—
Siedle, Allen R.; and Howells, Richard D., 4,556,720, Cl. 556-22.000.

Hoyle, Charles E.: *See*—
Lenox, Ronald S.; Schwartz, Anne L.; and Hoyle, Charles E., 4,556,625, Cl. 430-145.000.

Hsiao, Charles H., to Key Pharmaceuticals, Inc. Sustained release propranolol tablet. 4,556,678, Cl. 514-652.000.

Hsieh, Henry L.: *See*—
Yeh, Gene H. C.; Martin, Joel L.; and Hsieh, Henry L., 4,556,647, Cl. 502-102.000.

Hubbard, George M., to M/A-COM Omni Spectra, Inc. Hermetically sealed connector. 4,556,271, Cl. 339-94.00C.

Huber, Lothar, to Luk Lamellen und Kupplungsbau GmbH. Friction clutch. 4,556,133, Cl. 192-70.160.

Hudak, Janos: *See*—
Hegedus, Bela; Balint, Sandor; Hudak, Janos; Barta, Gyorgy; and Aszlanyi, Jozsef, 4,555,858, Cl. 34-25.000.

Huffy Corporation, The: *See*—
Diekman, Robert L., 4,556,230, Cl. 280-301.000.

Hughes Aircraft Company: *See*—
McKenna, Charles M.; Clark, William M., Jr.; and Seliger, Robert L., 4,556,798, Cl. 250-492.200.
Ward, James W.; Schlanger, Herbert; McNulty, Hugh, Jr.; and Parker, Norman W., 4,556,794, Cl. 250-309.000.

Hughes, John T., to Micropore International Limited. Panels of thermal insulation material. 4,556,593, Cl. 428-72.000.

Hughes, Richard H.: *See*—
Chen, Hsing-Yao; and Hughes, Richard H., 4,556,819, Cl. 313-413.000.

Hugl, Herbert: *See*—
Weitz, Robert; Neeff, Rutger; and Hugl, Herbert, 4,556,401, Cl. 8-641.000.

Hugus, George D.; and Young, A. Mark, to United States of America, Navy. Underwater sound generator. 4,556,963, Cl. 367-143.000.

Hulsebusch, William H.: *See*—
Sears, I. Weir; Hostetler, John E.; and Hulsebusch, William H., 4,555,814, Cl. 2-227.000.

Hultner, Karl: *See*—
Schaut, Josef; Ruppel, Peter; and Hultner, Karl, 4,556,302, Cl. 354-83.000.

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Brown, Paul P., 4,556,377, Cl. 425-138.000.

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Tobias, Russell H.; and Hutchings, David A., 4,556,860, Cl. 338-22.0SD.

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Stewart, Donald F.; Tubridy, Michael F.; and Huthwaite, Herbert J., 4,556,696, Cl. 525-432.000.

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Andrae, Klaus; Bytzek, Max; Hutschenreuter, Elfried; and Lang, Hans U., 4,556,708, Cl. 536-57.000.

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Martinez-Vera, Enrique R.; and Bustani-Adem, Alberto, 4,556,417, Cl. 75-35.000.

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Honma, Junji, 4,556,537, Cl. 422-49.000.
Tsubouchi, Toshiyuki; and Hata, Hitoshi, 4,556,503, Cl. 252-73.000.
Ihara, Shinji: *See—*
Ando, Hiroyuki; Tanabe, Toshio; and Ihara, Shinji, 4,555,849, Cl. 30-388.000.
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Van Prooijen, Pieter, 4,555,947, Cl. 73-861.060.
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Ikushige, Tetsuo: *See—*
Matsushita, Susumu; Tada, Yoshimitsu; Ikushige, Tetsuo; and Baba, Nobuyuki, 4,556,538, Cl. 422-70.000.
Illy, Ernesto, to Illycaffe S.p.A. Apparatus for making strips of coherent packets containing ground coffee or the like. 4,555,894, Cl. 53-528.000.
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Scott, Graham W.; and Steven, James H., 4,556,466, Cl. 204-182.200.
Imperial Clevite Inc.: *See—*
Kowal, Leonard J.; and Schwarz, Albert J., 4,556,242, Cl. 285-341.000.
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Raab, Andrew F.; and Cobb, Albert R., III, 4,556,764, Cl. 200-16.00C.
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Hoffmann, Heiner, 4,556,065, Cl. 128-639.000.
Ingersoll-Rand Company: *See—*
VanLoon, Donald F.; and Miller, Bernard F., 4,556,223, Cl. 277-118.000.
Innocente Riganti Officine Meccaniche S.p.A.: *See—*
Buzzi, Fabio; and Riganti, Emilio, 4,555,835, Cl. 29-156.80R.
Innovative Bearing Corporation: *See—*
Goode, Richard L., 4,556,122, Cl. 181-136.000.
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Shioiri, Tomonori; and Ino, Takashi, 4,556,478, Cl. 208-120.000.
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Inoue, Kiyoshi, 4,556,775, Cl. 219-76.130.
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Intercontrole Societe Anonyme: *See—*
D'Hondt, Jean-Pierre, 4,556,846, Cl. 324-238.000.
Intergraph Corporation: *See—*
Thomas, Christopher L., 4,556,825, Cl. 315-408.000.
Interlego AG: *See—*
Bolli, Peter, 4,556,393, Cl. 446-91.000.
Interlock Industries Limited: *See—*
Davis, Ronald P., 4,555,829, Cl. 16-342.000.
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Abernathey, John R.; and Koburger, Charles W., III, 4,556,585, Cl. 427-85.000.
Advani, Hira; and Hayes, Gerald E., 4,556,954, Cl. 364-900.000.
Allen, Wade H.; Cory, Theodore M.; and Thornton, Raymond A., 4,556,959, Cl. 364-900.000.
Best, John S.; and Bullock, David C., 4,556,597, Cl. 428-201.000.
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Dwire, Jerold D.; and Crehan, Donald T., 4,556,878, Cl. 340-724.000.
Greschner, Johann; Schwerdt, Friedrich W.; and Trumpp, Hans J., 4,556,628, Cl. 430-314.000.
Keller, John H.; and Winnard, James R., 4,556,823, Cl. 315-111.810.
Kim, Kyong M.; Smetana, Pavel; and Schwuttke, Gunther H., 4,556,448, Cl. 156-605.000.
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Olderdissen, Ulrich; and Schumacher, Hans, 4,556,977, Cl. 371-37.000.
Parker, Tony E.; and Veneski, Gerard A., 4,556,938, Cl. 364-200.000.
Quist, Frederick F., Jr.; and Steinbrecher, Marc L., 4,556,924, Cl. 360-106.000.
Strope, Douglas H.; and Wray, Thomas E., 4,556,845, Cl. 324-230.000.
Treseder, Robert C.; and Savarese, Thomas G., 4,556,969, Cl. 369-291.000.
International Computers Limited: *See—*
Howarth, James, 4,556,976, Cl. 371-25.000.
International Flavors & Fragrances Inc.: *See—*
Fujioka, Futoshi; Boden, Richard M.; and Schreiber, William L., 4,556,746, Cl. 568-648.000.
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Collet-Cassart, Daniel; Mareschal, Jean-Claude; and Masson, Pierre L., 4,556,642, Cl. 436-500.000.
International Rectifier Corporation: *See—*
Meddles, Dennis, 4,556,896, Cl. 357-70.000.
Irikura, Tsutomu; Suzue, Seigo; and Okada, Kodo, to Kyorin Pharmaceutical Co., Ltd. Nicotinic acid derivatives. 4,556,715, Cl. 546-322.000.
Irons, George P., to United States Manufacturing Company. Knee orthosis with leg stabilizing means. 4,556,053, Cl. 128-80.00C.
Ishida, Hiroshi: *See—*
Yamawaki, Satoshi; Sugihara, Atsushi; Kobayashi, Yasushi; Ishida, Hiroshi; Kuramasu, Yukio; and Gotoh, Ichisei, 4,556,165, Cl. 228-223.000.
Ishiguro, Fumio, to Hoshizaki Electric Co., Ltd. Ice product making machine. 4,555,913, Cl. 62-347.000.
Ishii, Kunihiko: *See—*
Shibukawa, Mitsuru; Shibuya, Chisei; and Ishii, Kunihiko, 4,556,651, Cl. 514-191.000.
Ishii, Yoshinori: *See—*
Kobayashi, Susumu; Muramoto, Yutaka; Ishizaka, Hideo; and Ishii, Yoshinori, 4,556,837, Cl. 320-2.000.
Ishikawa, Akibumi: *See—*
Shishido, Yoshio; Nishigaki, Shinichi; Kato, Shinichi; Matsuo, Kazumasa; Miyazaki, Atsushi; Takahashi, Susumu; Nakamura, Takeaki; and Ishikawa, Akibumi, 4,556,787, Cl. 250-201.000.
Ishioka, Sachio: *See—*
Kusano, Chushirou; Ishioka, Sachio; Imamura, Yoshinori; Takasaki, Yukio; Ogawa, Hirofumi; Makishima, Tatsuo; Hirai, Tadaaki; and Maruyama, Eiichi, 4,556,817, Cl. 313-371.000.
Ishiwatari, Hiromasa, to Matsushita Electric Industrial Co., Ltd. Irradiated power monitoring system for optical fiber. 4,556,875, Cl. 340-679.000.
Ishizaka, Hideo: *See—*
Kobayashi, Susumu; Muramoto, Yutaka; Ishizaka, Hideo; and Ishii, Yoshinori, 4,556,837, Cl. 320-2.000.
Isshiki, Tomiya; Kijima, Yasuhiko; Miyauchi, Yuh; and Kondo, Takao, to Mitsubishi Gas Chemical Company, Inc. Process for producing acetic anhydride. 4,556,519, Cl. 260-549.000.
Ito, Katsuya, to Tokai Electric Wire Company Limited. Water-proof connector. 4,556,226, Cl. 277-207.00A.
Ito, Nobuei: *See—*
Atsumi, Morihiro; Yoshida, Hitoshi; Ito, Nobuei; and Atsumi, Kinya, 4,556,780, Cl. 219-270.000.
Ito, Toshiharu; Ozeki, Eiji; and Okada, Kozo, to NGK Spark Plug Co., Ltd. Piezoelectric ultrasonic transducer with porous plastic housing. 4,556,814, Cl. 310-334.000.
Ito, Toshimitsu; and Kobayashi, Nobuyuki, to Toyota Jidosha Kabushiki Kaisha. Air/fuel ratio feedback control for an internal combustion engine. 4,556,033, Cl. 123-440.000.
Itoki Kosakusho Co., Ltd.: *See—*
Matimura, Tugumi, 4,555,828, Cl. 16-95.00R.
ITT Corporation: *See—*
Casilli, Joseph C., 4,556,087, Cl. 138-30.000.
Goldman, Stuart O., 4,556,760, Cl. 179-2.0EB.

Iwahashi, Hiroshi; and Asano, Masamichi, to Tokyo Shibaura Denki Kabushiki Kaisha. Semiconductor memory with delay means to reduce peak currents. 4,556,961, Cl. 365-194.000.

Iwakiri, Norio: *See*—
Atsumi, Haruo; Iwakiri, Norio; Kiyono, Yasuhiro; and Hayakawa, Tomohiko, 4,556,768, Cl. 200-302.200.

Iwakura, Tatsuya: *See*—
Takazoe, Ichiro; Ohta, Kosei; Shimizu, Junichi; Suzuki, Kazumasa; Iwakura, Tatsuya; and Nakajima, Yoshikazu, 4,556,429, Cl. 127-30.000.

Iwatsuki, Masahiro: *See*—
Kuwakado, Satosi; Shimogawa, Toshiaki; Koide, Teruhiko; Kanada, Shigeyasu; and Iwatsuki, Masahiro, 4,556,177, Cl. 242-107.40A.

Izawa, Masao; and Tatsukawa, Sachiko, to Olympus Optical Co., Ltd. Method and apparatus for dislodging cultured cells. 4,556,639, Cl. 435-284.000.

Izawa, Yuji: *See*—
Ohta, Hisao; Baji, Toru; Izawa, Yuji; Ebisui, Eizou; Tsukada, Toshihisa; and Yamamoto, Hideaki, 4,556,800, Cl. 250-578.000.

Izuta, Tadao, to Nippon Gakki Seizo Kabushiki Kaisha. Stabilizer for archery bows. 4,556,042, Cl. 124-89.000.

J. M. Voith GmbH: *See*—
Meinecke, Albrecht, 4,556,453, Cl. 162-274.000.

Jackson, Dale E., to Carrier Corporation. Arc welding at high part speeds. 4,556,778, Cl. 219-125.110.

Jackson, Gregg B. Boat with auxiliary steering apparatus. 4,556,005, Cl. 114-146.000.

Jacobsson, Bjorn: *See*—
Palmaer, Tore; Palmaer, Leif; and Jacobsson, Bjorn, 4,556,121, Cl. 181-129.000.

Jacoby, John E.: *See*—
Bowman, Kenneth A.; Jacoby, John E.; and Finn, Kellen M., 4,556,535, Cl. 420-580.000.

Jacques, Alain: *See*—
Demangeon, Yvon; and Jacques, Alain, 4,556,509, Cl. 252-542.000.

Jaeneke, Christian: *See*—
Romer, Rudolf; Jaeneke, Christian; Bethmann, Karl W.; and Moll, Manfred, 4,555,971, Cl. 89-1.110.

James, Benny R., to Harris, Alton C. Pipe aligning tool. 4,555,841, Cl. 29-468.000.

Janson, Gunnar H., to Dana Corporation. Axle clutch actuator. 4,556,258, Cl. 301-128.000.

Janssen Pharmaceutica N.V.: *See*—
Janssens, Frans E.; Torremans, Joseph L. G.; Hens, Jozef F.; and Van Offenwert, Theophilus T. J. M., 4,556,660, Cl. 514-272.000.

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Japan Atomic Energy Research Institute: *See*—
Kondo, Tatsuo; Tamura, Manabu; Tanimura, Masayuki; and Kamemura, Yoshiki, 4,556,423, Cl. 75-125.000.

Japan Tobacco & Salt Public Corporation, The: *See*—
Horie, Motonobu; Suzuki, Minoru; and Ogura, Shinji, 4,556,072, Cl. 131-282.000.

Japanese National Railways: *See*—
Oishibashi, Hirotsugu; Ueyama, Katsuyoshi; Ohara, Muneyuki; Nakamura, Mitsuo; Aichi, Takeo; and Sasaki, Shigeru, 4,556,164, Cl. 228-199.000.

Jaswa, Vijay C.: *See*—
Dickenson, Royston J.; and Jaswa, Vijay C., 4,556,956, Cl. 364-162.000.

JB Group, Inc.: *See*—
Krueger, Ronald G., 4,556,440, Cl. 156-181.000.

Jean, Benoit; Bergevin, Benoit; and Rheault, Fernand, to Soltrac, Inc. Vapor pressure pump. 4,556,368, Cl. 417-208.000.

Jeffers, Robert K.: *See*—
Boucher, Stephen G.; and Jeffers, Robert K., 4,555,938, Cl. 73-187.000.

Jenkins, Patrick A., to Borg-Warner Corporation. Differential pressure sensor. 4,555,952, Cl. 73-861.470.

Jensen, Steven C., to Minnesota Mining and Manufacturing Company. Adjusting apparatus for a doctor blade structure for copy machines. 4,556,307, Cl. 355-3.00R.

John Fluke Mfg. Co., Inc.: *See*—
George, Richard E., 4,556,867, Cl. 340-347.0NT.

John Thomas Batts, Inc.: *See*—
Blanchard, Russell O.; and Batts, John H., 4,556,158, Cl. 223-88.000.

Johnson, Judith L.: *See*—
Showalter, Howard D. H.; Johnson, Judith L.; Werbel, Leslie M.; and Elslager, Edward F., 4,556,654, Cl. 514-222.000.

Johnson, Larry J.: *See*—
Frankel, Arthur E.; Johnson, Larry J.; and Wennberg, Timothy J., 4,555,957, Cl. 73-864.140.

Johnson, Michael D., to Becton, Dickinson and Company. Slip resistant gloves. 4,555,813, Cl. 2-161.00R.

Johnson, Peter A., to Figgie International Inc. Conveyor. 4,556,143, Cl. 198-841.000.

Johnson, Roy J. Method of installing a pivotal ladder to a vehicle. 4,556,125, Cl. 182-91.000.

Johnson, Timothy L.: *See*—
Bohrer, Philip J.; Higashi, Robert E.; Johnson, Timothy L.; and Satren, Ernest A., 4,555,939, Cl. 73-198.000.

Johnston, Arthur M., to Coal Industry (Patents) Limited. Dust assessment apparatus and method. 4,555,933, Cl. 73-28.000.

Jones, Howard: *See*—
Suh, John T.; Skiles, Jerry W.; Piwinski, John J.; Menard, Paul; and Jones, Howard, 4,556,652, Cl. 514-211.000.

Jones, Michael M.: *See*—
Miller, Walter E., Jr.; Westrich, Richard G., Jr.; and Jones, Michael M., 4,556,313, Cl. 356-1.000.

Jones, William E. M. Automatic shutoff device. 4,556,093, Cl. 141-206.000.

Josef Gartner & Co.: *See*—
Gartner, Fritz, 4,555,890, Cl. 52-745.000.

Joy Manufacturing Company: *See*—
Frey, G. Robert; Chandler, Gregory M.; and King, Richard A., 4,556,117, Cl. 180-89.130.
Le, Tri C., 4,556,224, Cl. 277-118.000.

Juelke, Charles V.: *See*—
Gunkel, Louis T.; and Juelke, Charles V., 4,556,684, Cl. 524-141.000.

Juillard, Yves, to Societe Alsacienne de Construction de Material Textile. Weft-thread mixer device for weaving machines. 4,556,089, Cl. 139-453.000.

Julius Blum Gesellschaft m.b.H.: *See*—
Rock, Erich; and Brunner, Josef, 4,556,205, Cl. 269-2.000.

Jumel, Jean-Pierre, to Societe Nationale Industrielle et Aerospatiale. Machine for cutting pieces from a band material. 4,555,967, Cl. 83-106.000.

Justice, James C.; and Delli-Gatti, Frank A., Jr., to Coaltex, Inc. Horizontal edna miner. 4,556,257, Cl. 299-68.000.

Kabushiki Kaisha Daikin Seisakusho: *See*—
Abe, Minoru, 4,556,137, Cl. 192-111.00A.

Kabushiki Kaisha Nippon Coinco: *See*—
Akagawa, Masaki; Onda, Hideaki; Kobayashi, Osamu; and Nishiumi, Kenji, 4,556,139, Cl. 194-4.00C.

Kabushiki Kaisha S G: *See*—
Shimizu, Wataru; and Yamashita, Akira, 4,556,886, Cl. 340-870.320.

Kabushiki Kaisha Sakata Shokai: *See*—
Yamazaki, Taro; Okamoto, Masashi; Iizuka, Tokio; Tsukada, Norishige; and Okamori, Kenji, 4,556,918, Cl. 358-283.000.

Kabushiki Kaisha Suiken: *See*—
Sato, Toshiyuki; and Kaida, Tadayuki, 4,556,227, Cl. 277-207.00A.

Kabushiki Kaisha Suwa Seikosha: *See*—
Ikejiri, Hiroaki, 4,556,905, Cl. 358-154.000.
Matsushita, Yoshikazu; Takei, Masaki; Yonekubo, Masatoshi; and Nishiwaki, Tsutomu, 4,556,891, Cl. 346-76.0PH.
Mogami, Takao; and Kawashima, Hiroshi, 4,556,605, Cl. 428-331.000.

Kabushiki Kaisha Tokai Riki Denki Seisakusho: *See*—
Kuwakado, Satosi; Shimogawa, Toshiaki; Koide, Teruhiko; Kanada, Shigeyasu; and Iwatsuki, Masahiro, 4,556,177, Cl. 242-107.40A.

Kabushiki Kaisha Universal: *See*—
Okada, Kazuo, 4,556,140, Cl. 194-4.00C.

Kadin, Saul B., to Pfizer Inc. 3-Substituted 2-oxindole-1-carboxamides as analgesic and anti-inflammatory agents. 4,556,672, Cl. 514-414.000.

Kaga, Matasaburo: *See*—
Okamoto, Toshiaki; Oguma, Tomio; and Kaga, Matasaburo, 4,556,038, Cl. 123-564.000.

Kahle, Lisa M., to PPG Industries, Inc. Compound bend roll forming. 4,556,406, Cl. 65-106.000.

Kaida, Tadayuki: *See*—
Sato, Toshiyuki; and Kaida, Tadayuki, 4,556,227, Cl. 277-207.00A.

Kainuma, Keiji: *See*—
Hiruma, Teruo; Honma, Atsushi; Hirano, Tooru; Tsuchiya, Yutaka; Hayata, Yoshihiro; Aizawa, Katsuo; Kato, Harubumi; and Kainuma, Keiji, 4,556,057, Cl. 128-303.100.

Kaiser, Joachim: *See*—
Kranz, Jakob; Kaiser, Joachim; Wiegemann, Hans-Bertram; and Baron, Klaus U., 4,556,320, Cl. 356-350.000.

Kaitatsu, Nobuaki: *See*—
Miyamoto, Hirofumi; Kaitatsu, Nobuaki; Sugitani, Junichi; Taniguchi, Yasumaru; and Kaji, Tetsuo, 4,555,948, Cl. 73-640.000.

Kaji, Tetsuo: *See*—
Miyamoto, Hirofumi; Kaitatsu, Nobuaki; Sugitani, Junichi; Taniguchi, Yasumaru; and Kaji, Tetsuo, 4,555,948, Cl. 73-640.000.

Kajino, Isao: *See*—
Yamanaka, Seisuke; Sase, Masatoshi; Yoshioka, Osamu; and Kajino, Isao, 4,556,912, Cl. 358-213.000.

Kalakutsky, Lev I.; Sychenkov, Vladimir V.; Vlasov, Vladimir B.; and Dubrovsky, Adolf V., deceased (by Dubrovskaya, Nina V., administrator), to Vsesojuzny Nauchno-Issledovatelsky Institut Nerudnykh Stroitelnykh Materialov Gidromekhanizatsii. Apparatus for measuring the grain-size composition of powders. 4,556,849, Cl. 324-464.000.

Kalil, Lou F.; and Reinhardt, Victor, to United States of America, National Aeronautics and Space Administration. Temperature averaging thermal probe. 4,556,327, Cl. 374-115.000.

Kalk, Franklin: *See*—
Pelkey, Kathleen; and Kalk, Franklin, 4,556,968, Cl. 369-287.000.

Kamanaka, Ryusuke: *See*—
Kuwa, Masatoshi; Kamanaka, Ryusuke; and Nihei, Toshio, 4,556,103, Cl. 165-122.000.

Kamemura, Yoshiki: *See*—
Kondo, Tatsuo; Tamura, Manabu; Tanimura, Masayuki; and Kamemura, Yoshiki, 4,556,423, Cl. 75-125.000.

Kamijo, Eiji; and Higuchi, Matsuo, to Sumitomo Electric Industries, Ltd. Process and apparatus for manufacturing fine powder. 4,556,416, Cl. 75-0.50B.

Kamm, Jurgen: *See*—
Voigt, Karl; Kamm, Jurgen; and Norbert, John, 4,555,994, Cl. 110-261.000.

Kampf, Wolfgang; and Herrmann, Christoph, to Chemische Werke Huels Aktiengesellschaft. Process for the isomerization of isolated double bonds to conjugated double bonds in low-molecular weight homo- and/or copolymers of 1,3-dienes. 4,556,754, Cl. 585-664.000.

Kamuro, Takashi; Ootsuga, Hisao; Saito, Isao; and Koga, Motoyuki, to Tokyo Gas Co., Ltd.; and Hakko Co., Ltd. Method of repairing pipes laid underground. 4,556,580, Cl. 427-8.000.

Kamyr Aktiebolag: *See*—
Richter, Johan C. F .C.; and Richter, Ole J., 4,556,494, Cl. 210-785.000.

Kanada, Shigeyasu: *See*—
Kuwakado, Satosi; Shimogawa, Toshiaki; Koide, Teruhiko; Kanada, Shigeyasu; and Iwatsuki, Masahiro, 4,556,177, Cl. 242-107.40A.

Kanaiwa, Kazuhide: *See*—
Nagata, Sumio; Kanaiwa, Kazuhide; and Ichikawa, Takashi, 4,556,096, Cl. 164-79.000.

Kane, Richard E.: *See*—
Bolin, Philip C.; Bowman, Gary K.; Ellis, Charles S.; Hopkins, Melvyn D.; and Kane, Richard E., 4,556,755, Cl. 174-21.00C.

Kanegafuchi Kagaku Kogyo Kabushiki Kaisha: *See*—
Samejima, Yasushi; Shiga, Minoru; Kano, Toshiji; and Yamada, Kiyoshi, 4,556,470, Cl. 204-266.000.

Kaneki, Satoru; and Tabuchi, Kazuhiro, to Dai Nippon Insatsu Kabushiki Kaisha. Photomask blank and photomask. 4,556,608, Cl. 428-629.000.

Kaneko, Yasunori: *See*—
Maki, Masao; Kaneko, Yasunori; and Fukuda, Hiroshi, 4,556,048, Cl. 126-417.000.

Kanematsu, Kiyoshi: *See*—
Nishigaki, Haruo; Watanabe, Koji; Fukui, Shiroh; and Kanematsu, Kiyoshi, 4,556,511, Cl. 252-573.000.

Kangas, Lauri V. M.: *See*—
Sodervall, Marja-Liisa; Kurkela, Kauko O. A.; Karjalainen, Arto J.; Toivola, Reijo J.; Kangas, Lauri V. M.; and Blanco, Guillermo L., 4,556,677, Cl. 514-651.000.

Kanner, Bernard; Quirk, Jennifer M.; De Monte, Arthur P.; and Hopper, Steven P., to Union Carbide Corporation. Process for preparing triacetoxysilanes from tris(amino)silanes. 4,556,725, Cl. 556-442.000.

Kano, Takao; and Makino, Katsuhiko, to Sumtak Corporation. Rotary encoder assembly and installation fixture. 4,556,792, Cl. 250-231.0SE.

Kano, Tokio; and Tamagawa, Akira, to Olympus Optical Co., Ltd. Method of judging a particle agglutination reaction and a reaction vessel for use in the method. 4,556,641, Cl. 436-165.000.

Kano, Toshiji: *See*—
Samejima, Yasushi; Shiga, Minoru; Kano, Toshiji; and Yamada, Kiyoshi, 4,556,470, Cl. 204-266.000.

Kanojia, Ramesh M.; Bandurco, Victor T.; Levine, Seymour D.; Mulvey, Dennis M.; and Tobia, Alfonso J., to Ortho Pharmaceutical Corporation. 3,4-Dialkoxy-2-alkylcarbonyl analino compounds. 4,556,739, Cl. 564-443.000.

Kanto Denka Kogyo Co., Ltd.: *See*—
Ohbayashi, Nobuo; Kawata, Akiho; Miya, Shuichi; and Niinuma, Teruhisa, 4,556,604, Cl. 428-323.000.

Kanto, Noriharu; Hosaka, Yukihiro; Sasaki, Yoshio; Kuramoto, Tatsuo; and Kimura, Masato, to Mitsubishi Denki Kabushiki Kaisha. Freezing apparatus. 4,555,914, Cl. 62-380.000.

Kanzawa, Ryosaku: *See*—
Yamada, Kazuji; Sato, Hideo; Kato, Kazuo; Sasayama, Takao; Kawakami, Kanji; and Kanzawa, Ryosaku, 4,556,807, Cl. 307-491.000.

Karjalainen, Arto J.: *See*—
Sodervall, Marja-Liisa; Kurkela, Kauko O. A.; Karjalainen, Arto J.; Toivola, Reijo J.; Kangas, Lauri V. M.; and Blanco, Guillermo L., 4,556,677, Cl. 514-651.000.

Karl Kuntze (GmbH & Co.): *See*—
Kuntze, Richard, 4,555,854, Cl. 33-138.000.

Karrer, Friedrich, to Ciba-Geigy Corporation. N-(Polyalkylpiperidinyl)-carbamates of polyols. 4,556,714, Cl. 546-190.000.

Kasahara, Shin-ichi: *See*—
Tazima, Yoshihisa; Morishima, Masayuki; Okumura, Hiroshi; and Kasahara, Shin-ichi, 4,556,770, Cl. 219-10.49R.

Kasper, Horst; and Eckhard, Pritsch, to Uranit GmbH. Hysteresis motor rotor having cylindrical shape with reduced wall thickness outside stator region. 4,556,810, Cl. 310-256.000.

Kassai Kabushikikaisha: *See*—
Kassai, Kenzou, 4,556,249, Cl. 297-30.000.

Kassai, Kenzou, to Kassai Kabushikikaisha. Collapsible chair. 4,556,249, Cl. 297-30.000.

Kato, Harubumi: *See*—
Hiruma, Teruo; Honma, Atsushi; Hirano, Tooru; Tsuchiya, Yutaka; Hayata, Yoshihiro; Aizawa, Katsuo; Kato, Harubumi; and Kainuma, Keiji, 4,556,057, Cl. 128-303.100.

Kato, Kazuo: *See*—
Yamada, Kazuji; Sato, Hideo; Kato, Kazuo; Sasayama, Takao; Kawakami, Kanji; and Kanzawa, Ryosaku, 4,556,807, Cl. 307-491.000.

Kato, Satoru: *See*—
Umeha, Genkichi; Urano, Shigeru; and Kato, Satoru, 4,556,532, Cl. 419-5.000.

Kato, Shinichi: *See*—
Shishido, Yoshio; Nishigaki, Shinichi; Kato, Shinichi; Matsuo, Kazumasa; Miyazaki, Atsushi; Takahashi, Susumu; Nakamura, Takeaki; and Ishikawa, Akibumi, 4,556,787, Cl. 250-201.000.

Katoo, Hisashi; Fujiwara, Kunio; and Kawashima, Yoshikazu, to Mitsubishi Denki Kabushiki Kaisha. Robot vehicle. 4,556,940, Cl. 364-424.000.

Katz, Saul N.; and Kearney, Donald T., to General Foods Corporation. Method for aromatizing soluble coffee. 4,556,575, Cl. 426-594.000.

Katzin, Leonard. Compartmentalized dynamic mixing apparatus. 4,556,325, Cl. 366-130.000.

Kaufman, Harold B., Jr.; McCarthy, John P.; Entner, Bernard J.; and Wallenfels, Kurt, to DCA Food Industries Inc. Method of fixing an edible coating to a food product. 4,556,572, Cl. 426-289.000.

Kaupat, Peter H. Kayak steering system. 4,556,006, Cl. 114-162.000.

Kawada, Yasuyuki: *See*—
Morita, Hiroshi; Kawada, Yasuyuki; Yamada, Junichi; and Ukigai, Toshiyuki, 4,556,108, Cl. 166-274.000.

Kawaguchi, Kazuo: *See*—
Sano, Tsunenori; and Kawaguchi, Kazuo, 4,556,336, Cl. 401-199.000.

Kawai, Kiyoshi; Kokubo, Toshiyuki; and Miyoshi, Yoshihiro, to Sumitomo Chemical Company, Limited. Solid catalyst component for olefin polymerization. 4,556,648, Cl. 502-112.000.

Kawai, Osamu, to NSK-Warner K.K. Anchor mounting device. 4,556,255, Cl. 297-483.000.

Kawakami, Kanji: *See*—
Yamada, Kazuji; Sato, Hideo; Kato, Kazuo; Sasayama, Takao; Kawakami, Kanji; and Kanzawa, Ryosaku, 4,556,807, Cl. 307-491.000.

Kawamoto, Akio: *See*—
Arima, Tetsuo; Kawamoto, Akio; and Osawa, Hide, 4,556,565, Cl. 426-3.000.

Kawasaki Jukogyo Kabushiki Kaisha: *See*—
Yoshida, Toshio, 4,556,240, Cl. 285-55.000.

Kawashima, Hiroshi: *See*—
Mogami, Takao; and Kawashima, Hiroshi, 4,556,605, Cl. 428-331.000.

Kawashima, Saburo; and Yamaguchi, Akihiro, to Mitsui Toatsu Chemicals, Inc. Process for preparation of 3,3'- or 3,4'-diamino benzophenone. 4,556,738, Cl. 564-329.000.

Kawashima, Yoshikazu: *See*—
Katoo, Hisashi; Fujiwara, Kunio; and Kawashima, Yoshikazu, 4,556,940, Cl. 364-424.000.

Kawata, Akiho: *See*—
Ohbayashi, Nobuo; Kawata, Akiho; Miya, Shuichi; and Niinuma, Teruhisa, 4,556,604, Cl. 428-323.000.

Kaye, Alex R. Boat with stabilizing flaps. 4,556,009, Cl. 114-354.000.

Kazlauskas, Gasparas. Welding apparatus for welding tubes to the back face of a tube sheet. 4,556,774, Cl. 219-60.200.

Kearney, Donald T.: *See*—
Katz, Saul N.; and Kearney, Donald T., 4,556,575, Cl. 426-594.000.

Keightley, John H.: *See*—
Sorli, Duncan C.; and Keightley, John H., 4,556,306, Cl. 354-304.000.

Keller, John H.; and Winnard, James R., to International Business Machines Corporation. Multi-function charged particle apparatus. 4,556,823, Cl. 315-111.810.

Kemmner, Ulrich; and Soyer, Wolfgang, to Robert Bosch GmbH. Arrangement for feeding of fuel. 4,556,490, Cl. 210-349.000.

Kendall Company, The: *See*—
Semrow, Carolyn M., 4,556,066, Cl. 128-660.000.

Kenkel, Albert. Replacement windows with preformed corners. 4,555,869, Cl. 49-449.000.

Kennedy, Melvin R.; Nagel, Dietmar; and Arad, Abraham, to Buddy L Corporation. Stunt-performing toy vehicle. 4,556,396, Cl. 446-23.000.

Kennedy, Melvin R.: *See*—
Arad, Avi; Kennedy, Melvin R.; and Nagel, Dietmar, 4,556,397, Cl. 446-436.000.

Kerlin, Jack H.: *See*—
Hines, Gordon E.; and Kerlin, Jack H., 4,556,346, Cl. 408-88.000.

Kerton, Peter S.: *See*—
Snell, Thomas B.; and Kerton, Peter S., 4,556,016, Cl. 119-102.000.

Key Pharmaceuticals, Inc.: *See*—
Hsiao, Charles H., 4,556,678, Cl. 514-652.000.

KG Fabrik fur Electromotoren u. Electrische Apparate: *See*—
Lengsfeld, Karl; Link, Erich; and Erndt, Hans, 4,556,132, Cl. 192-12.0BA.

Khoury, Donald S., to Colt Industries Operating Corp. Firing pin locking device. 4,555,861, Cl. 42-70.00F.

Kickhofen, Botho: *See*—
Fischer, Herbert; Kickhofen, Botho; and Vaubel, Eckehard, 4,556,056, Cl. 128-156.000.

Kijima, Yasuhiko: *See*—
Isshiki, Tomiya; Kijima, Yasuhiko; Miyauchi, Yuh; and Kondo, Takao, 4,556,519, Cl. 260-549.000.

Kim, Bang M.; and Weininger, Joseph L., to General Electric Environmental Services, Inc. Electrolytic reactor for cleaning wastewater. 4,556,469, Cl. 204-263.000.

Kim, Byoung S., to AT&T Technologies, Inc. Method and apparatus for sensing tactile forces. 4,555,954, Cl. 73-862.040.

Kim, Don K., to Boryung Pharmaceutical Co., Ltd. Process for the preparation of acylureido penicillin derivatives. 4,556,516, Cl. 260-239.100.

Kim, Kyong M.; Smetana, Pavel; and Schwuttke, Gunther H., to International Business Machines Corporation. Method for controlled doping of silicon crystals by improved float zone technique. 4,556,448, Cl. 156-605.000.

Kimberly-Clark Corporation: *See—*
Meuli, Michael G., 4,556,596, Cl. 428-152.000.

Kimura, Masato: *See—*
Kanto, Noriharu; Hosaka, Yukihiro; Sasaki, Yoshio; Kuramoto, Tatsuo; and Kimura, Masato, 4,555,914, Cl. 62-380.000.

Kindersley, Peter G.; and Pyysalo, Matti O., to Neles Inc. Ball valve assembly with expandable valve element. 4,556,197, Cl. 251-315.000.

King, Edward T.; and Chui, Granger K., to Ford Motor Company. Engine lubrication system. 4,556,024, Cl. 123-196.0AB.

King, Michael, to CAE Electronics, Ltd. Six degree of freedom hand controller. 4,555,960, Cl. 74-471.0XY.

King, Richard A.: *See—*
Frey, G. Robert; Chandler, Gregory M.; and King, Richard A., 4,556,117, Cl. 180-89.130.

Kirayoglu, Birol, to Du Pont de Nemours, E. I., and Company. Heavy-weight nonwoven fabric of hydraulically-entangled fibers. 4,556,601, Cl. 428-219.000.

Kirby, Robert A., to Exxon Production Research Co. Modular gas-powered subsea seismic source. 4,556,120, Cl. 181-120.000.

Kiriu, Yukio: *See—*
Yamamoto, Toshiki; Kiriu, Yukio; Tsuneoka, Akira; and Sudo, Kunikane, 4,556,099, Cl. 164-451.000.

Kirpluk, Kenneth R.; and Lewinski, Kenneth F., to AT&T Teletype Corporation. CRT Monitor tilt mechanism. 4,556,189, Cl. 248-649.000.

Kiruna Truck, AB: *See—*
Niva, Karl-Erik, 4,556,356, Cl. 414-458.000.

Kishi, Hajimu; Seki, Masaki; Tanaka, Kunio; and Takegahara, Takashi, to Fanuc Ltd. Numerical control device. 4,556,833, Cl. 318-567.000.

Kishida, Kazuo; Yamamoto, Naoki; and Sato, Yasumasa, to Mitsubishi Rayon Co., Ltd. Thermoplastic resin composition having excellent impact resistance and heat resistance. 4,556,692, Cl. 525-78.000.

Kitada, Fumihiko: *See—*
Nishikawa, Hideo; Okamoto, Kenzo; Sakai, Koichi; and Kitada, Fumihiko, 4,556,045, Cl. 126-96.000.

Kitagawa, Jun: *See—*
Mochida, Shigeru; Kojima, Masaru; and Kitagawa, Jun, 4,556,543, Cl. 422-171.000.

Kitchen, George H., III; and Kitchen, Nancy E. Method for testing and treating stored fuel. 4,556,326, Cl. 374-45.000.

Kitchen, Nancy E.: *See—*
Kitchen, George H., III; and Kitchen, Nancy E., 4,556,326, Cl. 374-45.000.

Kiyono, Yasuhiro: *See—*
Atsumi, Haruo; Iwakiri, Norio; Kiyono, Yasuhiro; and Hayakawa, Tomohiko, 4,556,768, Cl. 200-302.200.

KLA Instruments Corporation: *See—*
Sandland, Paul; Chadwick, Curt H.; and Dwyer, Howard I., 4,556,317, Cl. 356-237.000.

Klages, Chester F., Jr.: *See—*
Doorley, Richard B.; Henninger, Paul J.; Klages, Chester F., Jr.; and Shetter, Jerrold K., 4,556,127, Cl. 184-3.100.

Kleindienst GmbH: *See—*
Bihler, Franz; and Abele, Anton, 4,556,229, Cl. 280-5.220.

Kleine, Richard A.: *See—*
Barsness, Gerald H.; and Kleine, Richard A., 4,556,044, Cl. 126-77.000.

Kline, Gerald R.; and Lakin, Kenneth M., to United States of America, Energy. Acoustic resonator with Al electrodes on an AlN layer and using a GaAs substrate. 4,556,812, Cl. 310-324.000.

Klingel, Hans, to Trumpf GmbH & Co. Punch press with multitool punch assembly. 4,555,966, Cl. 83-71.000.

Kloap, Philip: *See—*
Bahnck, Norman; and Kloap, Philip, 4,556,362, Cl. 414-744.00B.

Klockner-Humboldt-Deutz AG: *See—*
Wolter, Albrecht; and Herchenbach, Horst, 4,556,428, Cl. 106-102.000.

Klockner-Werke Aktiengesellschaft: *See—*
Berstermann, Wilhelm, 4,556,315, Cl. 356-313.000.

Klug, Lothar; and Schmuck, Klaus, to Akzo N.V. Ballooning action constraining ring. 4,555,900, Cl. 57-355.000.

Knapp, John F.: *See—*
Gruber, Robert J.; Koch, Ronald J.; Knapp, John F.; and Bolte, Steven B., 4,556,624, Cl. 430-110.000.

Knifton, John F., to Texaco Inc. Process for synthesizing formamides from synthesis gas plus ammonia. 4,556,734, Cl. 564-132.000.

Knight, Jack D.: *See—*
Duerksen, John H.; Wall, Robert G.; and Knight, Jack D., 4,556,107, Cl. 166-272.000.

Kniss, Helmut; and Locher, Johannes, to Robert Bosch GmbH. Method and apparatus for adapting and controlling the exhaust gas circulation rate. 4,556,039, Cl. 123-569.000.

Knodler, Helmut: *See—*
Lang, Armin; and Knodler, Helmut, 4,555,975, Cl. 91-417.00R.

Knop, Klaus; and Heinrich, Peter, to M.A.N. Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft. Method of operating a synthesis gas-ore reduction process. 4,556,421, Cl. 75-91.000.

Kobayashi, Nobuo, to Meidai Bussan Kabushiki Kaisha. Openable side panel for load carrying vehicles. 4,556,248, Cl. 296-183.000.

Kobayashi, Nobuyuki: *See—*
Ito, Toshimitsu; and Kobayashi, Nobuyuki, 4,556,033, Cl. 123-440.000.

Kobayashi, Osamu: *See—*
Akagawa, Masaki; Onda, Hideaki; Kobayashi, Osamu; and Nishiumi, Kenji, 4,556,139, Cl. 194-4.00C.

Kobayashi, Seishichi: *See—*
Taira, Kazuo; Morofuji, Akihiko; Kobayashi, Seishichi; and Ueno, Hiroshi, 4,556,151, Cl. 220-67.000.
Tsurumaru, Michiko; Nakazato, Seiichi; Nunokawa, Atsushi; Ueno, Hiroshi; and Kobayashi, Seishichi, 4,556,354, Cl. 413-15.000.

Kobayashi, Susumu; Muramoto, Yutaka; Ishizaka, Hideo; and Ishii, Yoshinori, to Terumo Kabushiki Kaisha. Electronic clinical thermometer. 4,556,837, Cl. 320-2.000.

Kobayashi, Toshihiko: *See—*
Sugio, Akitoshi; Masu, Masanobu; and Kobayashi, Toshihiko, 4,556,685, Cl. 524-141.000.

Kobayashi, Yasushi: *See—*
Yamawaki, Satoshi; Sugihara, Atsushi; Kobayashi, Yasushi; Ishida, Hiroshi; Kuramasu, Yukio; and Gotoh, Ichisei, 4,556,165, Cl. 228-223.000.

Koburger, Charles W., III: *See—*
Abernathey, John R.; and Koburger, Charles W., III, 4,556,585, Cl. 427-85.000.

Koch, Ronald J.: *See—*
Gruber, Robert J.; Koch, Ronald J.; Knapp, John F.; and Bolte, Steven B., 4,556,624, Cl. 430-110.000.

Kochan, Branislav R. Physical exerciser. 4,556,217, Cl. 272-141.000.

Kochnev, Anatoly M.: *See—*
Baldenko, Dmitry F.; Vadetsky, Jury V.; Goldobin, Vladimir B.; Gusman, Moisei T.; Kochnev, Anatoly M.; Nikomarov, Samuil S.; and Semenets, Valery I., 4,556,398, Cl. 464-16.000.

Koda, Akihide; Hori, Mikio; Matsuura, Naosuke; Yasumoto, Mitsugi; Yamawaki, Ichiro; Ueda, Shuichi; and Tada, Yukio, to Taiho Pharmaceutical Company Limited. Sulfonium compounds, processes for preparing the compounds and pharmacological composiitons containing the same. 4,556,737, Cl. 564-218.000.

Koe, B. Kenneth: *See—*
Welch, Willard M., Jr.; Harbert, Charles A.; Koe, B. Kenneth; and Kraska, Allen R., 4,556,676, Cl. 514-554.000.

Koehler, Gerard, to La Telemecanique Electrique. Bistable electromagnet with several armatures comprising a permanent magnet. 4,556,858, Cl. 335-234.000.

Koehler, Peter L. Earthworm irritant. 4,556,679, Cl. 514-764.000.

Koenneker, Reinhard: *See—*
Anklam, Bruno; Koenneker, Reinhard; and Mezger, Hans, 4,556,034, Cl. 123-470.000.

Koga, Motoyuki: *See—*
Kamuro, Takashi; Ootsuga, Hisao; Saito, Isao; and Koga, Motoyuki, 4,556,580, Cl. 427-8.000.

Kohno, Takeshi; and Usui, Seiji, to Horiba, Ltd. Flow through type glass electrode. 4,556,473, Cl. 204-409.000.

Kohsaka, Hiroji: *See—*
Amimoto, Hiroyuki; and Kohsaka, Hiroji, 4,555,931, Cl. 73-23.000.

Koide, Teruhiko: *See—*
Kuwakado, Satosi; Shimogawa, Toshiaki; Koide, Teruhiko; Kanada, Shigeyasu; and Iwatsuki, Masahiro, 4,556,177, Cl. 242-107.40A.

Kojima, Masaru: *See—*
Mochida, Shigeru; Kojima, Masaru; and Kitagawa, Jun, 4,556,543, Cl. 422-171.000.

Kokubo, Takashi: *See—*
Numata, Kiyoshi; Yoshida, Toshihiro; and Kokubo, Takashi, 4,556,283, Cl. 350-117.000.

Kokubo, Toshiyuki: *See—*
Kawai, Kiyoshi; Kokubo, Toshiyuki; and Miyoshi, Yoshihiro, 4,556,648, Cl. 502-112.000.

Koller, Ernst. Rack formed of a plurality of profiled bars. 4,556,148, Cl. 211-189.000.

Komatsu, Keiichi: *See—*
Shibata, Akira; and Komatsu, Keiichi, 4,556,917, Cl. 358-343.000.

Komoda, Yoshiyuki: *See—*
Fukagawa, Hitoshi; Suzuki, Yoshiharu; and Komoda, Yoshiyuki, 4,556,865, Cl. 340-310.00R.

Kondo, Takao: *See—*
Isshiki, Tomiya; Kijima, Yasuhiko; Miyauchi, Yuh; and Kondo, Takao, 4,556,319, Cl. 260-549.000.

Kondo, Tatsuo; Tamura, Manabu; Tanimura, Masayuki; and Kamemura, Yoshiki, to Nippon Kokan Kabushiki Kaisha; and Japan Atomic Energy Research Institute. Austenite stainless steels having excellent high temperature strength. 4,556,423, Cl. 75-125.000.

Kongs, David J.: *See—*
Landoll, Donald R.; Kongs, David J.; and Belknap, Alfred R., 4,556,357, Cl. 414-469.000.

Koninklijke Emballage Industrie Van Leer B.V.: *See—*
Koudstaal, Willem; and Streefkerk, Willem L., 4,556,349, Cl. 410-140.000.

Konishiroku Photo Industry Co., Ltd.: *See—*
Matsunawa, Masahiko, 4,556,916, Cl. 358-282.000.

Kopf, Peter W.: *See—*
Corcoran, Richard J.; Kopf, Peter W.; and Smith, Donald F., Jr., 4,556,693, Cl. 525-162.000.

Koppensteiner, Werner, to Otis Elevator Company. Elevator governor. 4,556,155, Cl. 187-38.000.

Koppers Company, Inc.: *See—*
Pfeiffer, John W., 4,556,079, Cl. 137-240.000.

Wallace, William E.; and Pourarian, Faiz, 4,556,551, Cl. 423-644.000.

Kotschenreuther, Paul C.: *See—*
Caprio, A. Ronald; Cyr, John P.; Geaghan, Bernard O.; Kotschenreuther, Paul C.; Schanin, David J.; and Salett, Ronald M., 4,556,953, Cl. 364-900.000.

Koudstaal, Willem; and Streefkerk, Willem L., to Koninklijke Emballage Industrie Van Leer B.V. Partition for a cargo carrier for bulk freight. 4,556,349, Cl. 410-140.000.

Kovacs, Kamilla: *See—*
Boross, Laszlo ; Szajani, Bela; and Kovacs, Kamilla, 4,556,637, Cl. 435-181.000.

Kowal, Leonard J.; and Schwarz, Albert J., to Imperial Clevite Inc. Vibration resistant high pressure tube fitting. 4,556,242, Cl. 285-341.000.

Kozlik, Tony J., to Honeywell Inc. Method for passing a token in a local-area network. 4,556,974, Cl. 370-89.000.

Kraemling, Franz; Muller, Achim; Linden, Ludwig; and Raedisch, Helmer, to Saint Gobain Vitrage. Laminated glasses using a non-thermoplastic adhesive insert layer. 4,556,600, Cl. 428-216.000.

Kraftwerk Union Aktiengesellschaft: *See—*
Cirkel, Hans-Jurgen; Bette, Willi; and Muller, Reinhard, 4,556,981, Cl. 372-86.000.

Kranz, Jakob; Kaiser, Joachim; Wiegemann, Hans-Bertram; and Baron, Klaus U., to TELDIX GmbH. Laser rotation rate sensor. 4,556,320, Cl. 356-350.000.

Kranz, Wolfgang: *See—*
Albersdoerfer, Otto; Blankenfeld, Heinz; Kranz, Wolfgang; and Weckwerth, Wolfgang, 4,556,284, Cl. 350-174.000.

Kraska, Allen R.: *See—*
Welch, Willard M., Jr.; Harbert, Charles A.; Koe, B. Kenneth; and Kraska, Allen R., 4,556,676, Cl. 514-554.000.

Kregness, Glen R.; Criswell, Peter B.; and DeKarske, Clarence W., to Sperry Corporation. Error checked high speed shift matrix. 4,556,978, Cl. 371-49.000.

Krepski, Larry R.: *See—*
Heilmann, Steven M.; Krepski, Larry R.; and Rasmussen, Jerald K., 4,556,723, Cl. 556-413.000.

Krude, Werner; Muller, Karl-Heinz; and Welschof, Hans-Heinrich, to Uni-Cardan Aktiengesellschaft. Drive shaft assembly for motor vehicles. 4,556,400, Cl. 464-181.000.

Krueger, Ronald G., to JB Group, Inc. Method and apparatus for production of bias fabrics. 4,556,440, Cl. 156-181.000.

Krufka, Frank S., to RCA Corporation. System and method for measuring the area and dimensions of apertures in an opaque medium. 4,556,902, Cl. 358-107.000.

Kruger, Franz J., to Raychem Corporation. Anhydrous primary battery. 4,556,617, Cl. 429-196.000.

Krumme, John F.: *See—*
Hodgson, Darel E.; and Krumme, John F., 4,556,050, Cl. 128-1.00R.

Kubo, Motonobu; and Honda. Kazumi, to Sanyo-Kokusaku Pulp Co., Ltd. Diacrylate and method for manufacturing the same. 4,556,729, Cl. 560-220.000.

Kubota, Ltd.: *See—*
Miyamoto, Hirofumi; Kaitatsu, Nobuaki; Sugitani, Junichi; Taniguchi, Yasumaru; and Kaji, Tetsuo, 4,555,948, Cl. 73-640.000.
Saito, Taro; Umeki, Kazumi; Ohno, Takaaki; Sakane, Hirobumi; Tsujino, Masahide; Sanpei, Keiichi; Nagamine, Yoshibumi; and Sato, Yoshitaka, 4,556,113, Cl. 172-91.000.

Kudamatsu, Akio: *See—*
Saito, Junichi; Kudamatsu, Akio; Kume, Toyohiko; and Tsuboi, Shinichi, 4,556,650, Cl. 514-128.000.

Kuehnle, Manfred R.: *See—*
Weber, Harold J.; Kuehnle, Manfred R.; Fraser, Kenneth D.; and Lindblom, Kenneth A., 4,556,309, Cl. 355-3.0TR.

Kuhfus, Gerd: *See—*
Dragunevicius, Algirdas J.; Kuhfus, Gerd; and Walker, Charles R. S., 4,556,763, Cl. 179-164.000.

Kuhn, Martin C.; and Zeitz, Vernon, to Mineral Separation Corporation. Apparatus for ultrasonic processing of materials. 4,556,467, Cl. 204-193.000.

Kuhnert, Gottfried, to Universal Maschinenfabrik Dr. Rudolf Schieber GmbH & Co., KG. Combined knitting-transfer cam unit for V-bed flat knitting machines with slider needles. 4,555,917, Cl. 66-78.000.

Kumagai, Naotake; Saga, Ikuo; Tatemoto, Minoru; and Tada, Tetsuya, to Mitsubishi Jidosha Kogyo Kabushiki Kaisha. Digital display device having a controlling apparatus responsive to low temperatures. 4,556,877, Cl. 340-713.000.

Kume, Toyohiko: *See—*
Saito, Junichi; Kudamatsu, Akio; Kume, Toyohiko; and Tsuboi, Shinichi, 4,556,650, Cl. 514-128.000.

Kumiai Kagaku Kogyo Kabushiki Kaisha: *See—*
Nishio, Kazuo; Chiyomaru, Isao; Anma, Katsuo; Yamamoto, Kazuko; Ohno, Hiroshi; and Takayanagi, Noriyasu, 4,556,669, Cl. 514-368.000.

Kummer, David A.: *See—*
Brewer, James A.; Eggebrecht, Lewis C.; Kummer, David A.; and McHugh, Patricia P., 4,556,952, Cl. 364-900.000.

Kuni, Asahiro; Hamada, Toshimitsu; Makihira, Hiroshi; and Yoshimura, Kazushi, to Hitachi, Ltd. Method and apparatus for detecting edge of fine pattern on specimen. 4,556,797, Cl. 250-492.200.

Kuntze, Richard, to Karl Kuntze (GmbH & Co.). Roll tape measure. 4,555,854, Cl. 33-138.000.

Kuramasu, Yukio: *See—*
Yamawaki, Satoshi; Sugihara, Atsushi; Kobayashi, Yasushi; Ishida, Hiroshi; Kuramasu, Yukio; and Gotoh, Ichisei, 4,556,165, Cl. 228-223.000.

Kuramoto, Tatsuo: *See—*
Kanto, Noriharu; Hosaka, Yukihiro; Sasaki, Yoshio; Kuramoto, Tatsuo; and Kimura, Masato, 4,555,914, Cl. 62-380.000.

Kurata, Yoshiharu, to Nakacawa Seisakusho Co., Ltd. Needle structure for tufting machine. 4,556,000, Cl. 112-222.000.

Kurihara, Yasutoshi; Suzuki, Yoshihiro; Ooue, Michio; Hachino, Hiroaki; and Yanagi, Mitsuo, to Hitachi, Ltd. Insulated type semiconductor devices. 4,556,899, Cl. 357-80.000.

Kurita, Kaora: *See—*
Motoyama, Shimesu; Kurita, Kaora; Sakashita, Shizuka; Takei, Narimichi; and Ohno, Shigeru, 4,556,175, Cl. 241-57.000.

Kurkela, Kauko O. A.: *See—*
Sodervall, Marja-Liisa; Kurkela, Kauko O. A.; Karjalainen, Arto J.; Toivola, Reijo J.; Kangas, Lauri V. M.; and Blanco, Guillermo L., 4,556,677, Cl. 514-651.000.

Kurokawa, Yoshiaki: *See—*
Naruse, Kazuo; Yokoi, Koji; and Kurokawa, Yoshiaki, 4,556,783, Cl. 219-388.000.

Kurosawa, Ryoichi, to Tokyo Shibaura Denki Kabushiki Kaisha. System for detecting position or speed. 4,556,885, Cl. 340-870.250.

Kurt Manufacturing Company, Inc.: *See—*
Lenz, John O., 4,555,853, Cl. 33-125.00M.

Kurtz, Rudiger: *See—*
Dahl, Hans; Holik, Herbert; Kurtz, Rudiger; and Stotz, Wolf-Gunter, 4,556,454, Cl. 162-358.000.

Kurz, Josef; and Stinglwagner, Andrea, to Kurz Kunststoffe GmbH. Roll holder, particularly for a rolled flat product. 4,556,160, Cl. 225-67.000.

Kurz Kunststoffe GmbH: *See—*
Kurz, Josef; and Stinglwagner, Andrea, 4,556,160, Cl. 225-67.000.

Kusano, Chushirou; Ishioka, Sachio; Imamura, Yoshinori; Takasaki, Yukio; Ogawa, Hirofumi; Makishima, Tatsuo; Hirai, Tadaaki; and Maruyama, Eiichi, to Hitachi, Ltd. Photoelectric conversion apparatus. 4,556,817, Cl. 313-371.000.

Kusisto, Ike W. Vehicle air conditioner ground wheel driven. 4,555,911, Cl. 62-241.000.

Kuwa, Masatoshi; Kamanaka, Ryusuke; and Nihei, Toshio, to Nepon Co. Ltd. Heat exchange apparatus with blower and helical conduit system. 4,556,103, Cl. 165-122.000.

Kuwakado, Satosi; Shimogawa, Toshiaki; Koide, Teruhiko; Kanada, Shigeyasu; and Iwatsuki, Masahiro, to Nippon Soken, Inc.; and Kabushiki Kaisha Tokai Riki Denki Seisakusho. Lock-type seat belt retractor of automobile. 4,556,177, Cl. 242-107.40A.

Kyorin Pharmaceutical Co., Ltd.: *See—*
Irikura, Tsutomu; Suzue, Seigo; and Okada, Kodo, 4,556,715, Cl. 546-322.000.

Kyoto Ceramic Company Ltd.: *See—*
Ueno, Masato; Sato, Masayoshi; Tasaka, Mitsuyuki; and Naito, Tatsuro, 4,556,389, Cl. 433-206.000.

Kyushu Tetsudo Kiki Seizo Co., Ltd.: *See—*
Oishibashi, Hirotsugu; Ueyama, Katsuyoshi; Ohara, Muneyuki; Nakamura, Mitsuo; Aichi, Takeo; and Sasaki, Shigeru, 4,556,164, Cl. 228-199.000.

La Telemecanique Electrique: *See—*
Koehler, Gerard, 4,556,858, Cl. 335-234.000.

Labofina, S.A.: *See—*
Debras, Guy L. G.; De Clippeleir, Georges E. M. J.; and Cahen, Raymond M., 4,556,753, Cl. 585-643.000.

Laboratoire Suisse de Recherches Horlogeres: *See—*
Hintermann, Hans E.; and Hertz, Dominique, 4,556,098, Cl. 164-316.000.

Laboratoires Jacques Logeais: *See—*
Maillard, Jacques G.; Van, Tri V.; Legeai, Jacky M.; and Benharkate, Marguerite M., 4,556,674, Cl. 514-426.000.

Laigar, Karl: *See—*
Munde, Jan C.; and Laigar, Karl, 4,556,331, Cl. 384-453.000.

L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude: *See—*
Laurenceau, Serge; Moufflet, Luc; and Genies, Bernerd, 4,556,384, Cl. 431-160.000.

Laitram Corporation, The: *See—*
Lapeyre, James M., 4,556,142, Cl. 198-822.000.

Lake, Barrie D.: *See—*
Bradley, Albert J.; and Lake, Barrie D., 4,556,447, Cl. 156-578.000.

Lakin, Kenneth M.: *See—*
Kline, Gerald R.; and Lakin, Kenneth M., 4,556,812, Cl. 310-324.000.

Lallement, Serge: *See—*
Billet, Maurice; and Lallement, Serge, 4,556,399, Cl. 464-175.000.

Lamb Technicon Corp.: *See—*
Faitel, William M., 4,556,141, Cl. 198-750.000.

Lamy, Jacques E.; and Serrano, Francisco de Asis M., to Compagnie Generale pour les Developpements Operationnels des Richesses sous-Marines "C.G. Doris". Floating device for hoisting and transporting loads. 4,556,004, Cl. 114-61.000.

Landefeld, James A.: *See—*
Hoppner, Werner F.; and Landefeld, James A., 4,556,308, Cl. 355-3.00R.

Landoll Corporation: *See—*
Landoll, Donald R.; Kongs, David J.; and Belknap, Alfred R., 4,556,357, Cl. 414-469.000.

Landoll, Donald R.; Kongs, David J.; and Belknap, Alfred R., to Landoll Corporation. Truck having articulated chassis for hauling goods. 4,556,357, Cl. 414-469.000.
Lang, Armin; and Knodler, Helmut, to Zahnradfabrik Friedrichshafen, AG. Hydraulic steering. 4,555,975, Cl. 91-417.00R.
Lang, Hans U.: *See*—
Andrae, Klaus; Bytzek, Max; Hutschenreuter, Elfried; and Lang, Hans U., 4,556,708, Cl. 536-57.000.
Lang, Richard D.: *See*—
Bolton, Theodore S.; and Lang, Richard D., 4,555,983, Cl. 98-114.000.
Langdon, Christopher, to Board of Governors for Higher Education, State of RI; and Providence Plantations. Computerized device for pulsed potential voltammetric measurement of oxygen using a membrance covered polarographic electrode. 4,556,472, Cl. 204-406.000.
Lange, Alois: *See*—
Bochinski, Rolf; Eimer, Klaus; Lange, Alois; and Nghiem, Xuan L., 4,556,102, Cl. 165-95.000.
Langmesser, Otto J., Jr.; Lock, Charles R.; and Wood, James C., to General Motors Corporation. Seat adjuster. 4,556,186, Cl. 248-429.000.
Lapeyre, James M., to Laitram Corporation, The. Lightweight modular conveyor belt. 4,556,142, Cl. 198-822.000.
Laping, Karlheinz: *See*—
Humbert, Heiko; and Laping, Karlheinz, 4,556,736, Cl. 564-204.000.
Laporte, Dorothy: *See*—
Rahn, Melanie H.; and Braun, Jane E., 4,556,390, Cl. 434-433.000.
Larson, Robert O., to Vikwood, Ltd. Stable anti-pest neem seed extract. 4,556,562, Cl. 424-195.100.
Larsson, Hakan A.: *See*—
Andersson, Folke O. A.; and Larsson, Hakan A., 4,556,269, Cl. 339-75.00M.
Laser Precision Corporation: *See*—
Doyle, Walter M., 4,556,316, Cl. 356-346.000.
Lau, Philip Y.: *See*—
Friedli, Hans R.; and Lau, Philip Y., 4,556,506, Cl. 252-512.000.
Laurenceau, Serge; Moufflet, Luc; and Genies, Bernerd, to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude. Burner for pulverized coal. 4,556,384, Cl. 431-160.000.
Laurent, Sebastian M.; and Sanders, Robert N., to Ethyl Corporation. Feeding of zeolite A to poultry. 4,556,564, Cl. 426-2.000.
Lawrenson, Malcolm J., to BP Chemicals Limited. Dismutation of functionalized olefins. 4,556,741, Cl. 568-395.000.
Le, Tri C., to Joy Manufacturing Company. Crossover seal assembly. 4,556,224, Cl. 277-118.000.
Leach, Thomas W.; and Schaeffer, James, to Control Instruments Corp. Digital gas sensing system. 4,555,930, Cl. 73-23.000.
LeaRonal, Inc.: *See*—
Tsiamis, Chris; and McCaskie, John E., 4,556,587, Cl. 427-304.000.
Lech, Thaddeus, Jr., to Borg-Warner Corporation. Clutch driven plate assembly. 4,556,136, Cl. 192-106.200.
Lecoffre, Yves; and Marcoz, Jean, to Aisthom-Atlantique. Microbubble injector. 4,556,523, Cl. 261-123.000.
Lee, Kwok P.: *See*—
Chan, Dominic K.; Lee, Kwok P.; and Martin, Ronald B., 4,556,972, Cl. 370-60.000.
Lee, Robert L. Dental articulator. 4,556,387, Cl. 433-58.000.
Lee, Shy-Fuh; and Henrick, Clive A., to Zoecon Corporation. 2-Nitro(cyano)phenyloxy(thio)alkyl phosphinates or phosphonates. 4,556,520, Cl. 260-951.000.
Lees, Wayne L.: *See*—
Taylor, Alwyn H.; Lees, Wayne L.; and Cook, Michael L., 4,556,613, Cl. 429-101.000.
Legeai, Jacky M.: *See*—
Maillard, Jacques G.; Van, Tri V.; Legeai, Jacky M.; and Benharkate, Marguerite M., 4,556,674, Cl. 514-426.000.
Leger, Andre : *See*—
Farge, Daniel; Leger, Andre ; and Ponsinet, Gerard, 4,556,657, Cl. 514-252.000.
Lehrer, Bradley D.; and Rivisto, Daniel A. Lighted novelty item. 4,556,932, Cl. 362-103.000.
Leland Stanford Junior University, Board of Trustees of the: *See*—
Shaw, Herbert J.; and Digonnet, Michel J. F., 4,556,279, Cl. 350-96.150.
Leman, Jean-Luc M.: *See*—
Mouille, Rene L.; and Leman, Jean-Luc M., 4,556,365, Cl. 416-134.00A.
le Mehaute, Alain; Hamaide, Thierry; Crepy, Gilles; and Marcellin, Georges, to Compagnie Generale d'Electricite. Method of producing a polymer based solid electrolyte for an electrochemical cell. 4,556,614, Cl. 429-191.000.
Lemme, Charles D.; and Lemme, Tracy R., to Blazer International Corp. Shape memory metal actuator. 4,556,934, Cl. 362-279.000.
Lemme, Charles D., to Blazer International Corp. Adjustable shape memory metal actuator. 4,556,935, Cl. 362-279.000.
Lemme, Tracy R.: *See*—
Lemme, Charles D.; and Lemme, Tracy R., 4,556,934, Cl. 362-279.000.
Lengsfeld, Karl; Link, Erich; and Erndt, Hans, to Frankl & Kirchner GmbH & Co.; and KG Fabrik fur Electromotoren u. Electrische Apparate. Adjustable electromagnetic clutch/brake. 4,556,132, Cl. 192-12.0BA.
Lenox, Ronald S.; Schwartz, Anne L.; and Hoyle, Charles E., to Armstrong World Industries, Inc. Development of a colored image on a cellulosic material with monosulfonyl azides. 4,556,625, Cl. 430-145.000.
Lenz, John O., to Kurt Manufacturing Company, Inc. Drive for position controlled linearly movable carriage. 4,555,853, Cl. 33-125.00M.
Leone-Bay, Andrea; and Timony, Peter E., to Stauffer Chemical Company. Herbicidal hydroxyamides of 2-bromo-4-methylimidazole-5-carboxylic acid. 4,556,412, Cl. 71-92.000.
Leroy, Andre ; and Flamme, Jean M., to Robert Bosch GmbH. Positive displacement machine having improved displacement curve. 4,556,372, Cl. 418-1.000.
Les Cables de Lyon: *See*—
Canivet, Jean-Luc, 4,555,898, Cl. 57-19.000.
Martin, Jean Marcel, 4,556,581, Cl. 427-29.000.
Lester, Leslie J.: *See*—
Stiff, Rodney A.; Baker, Malcolm J.; and Lester, Leslie J., 4,555,896, Cl. 56-13.900.
LeTarte, Walter G. Purging device for a filler carrier. 4,556,374, Cl. 425-114.000.
Letchford, John A.: *See*—
Frost, Kenneth S.; Halberstadt, Alex L.; and Letchford, John A., 4,556,786, Cl. 219-464.000.
Lever Brothers Company: *See*—
Blackmore, Eunice S.; Peterson, Gordon C.; and Tiddy, Gordon J. T., 4,556,502, Cl. 252-8.800.
Rek, Johannes H. M., 4,556,504, Cl. 252-135.000.
Levine, Peter A., to RCA Corporation. Reduction of noise in signal from charge transfer devices. 4,556,851, Cl. 329-50.000.
Levine, Seymour D.: *See*—
Kanojia, Ramesh M.; Bandurco, Victor T.; Levine, Seymour D.; Mulvey, Dennis M.; and Tobia, Alfonso J., 4,556,739, Cl. 564-443.000.
Levinstein, Hyman J.; and Vaidya, Sheila, to AT&T Bell Laboratories. Method of fabricating VLSI CMOS devices having complementary threshold voltages. 4,555,842, Cl. 29-571.000.
Levy, Nessim I. X-Y Tables particularly for use as plotters. 4,555,851, Cl. 33-18.00R.
Lewinski, Kenneth F.: *See*—
Kirpluk, Kenneth R.; and Lewinski, Kenneth F., 4,556,189, Cl. 248-649.000.
Lewis, Delmar D.: *See*—
Lewis, Donald E.; and Lewis, Delmar D., 4,556,222, Cl. 277-9.000.
Lewis, Donald E.; and Lewis, Delmar D. Auxiliary sealing system for fluid mixers. 4,556,222, Cl. 277-9.000.
Lewis, Harold M., to Marathon Manufacturing Company. Arcuate blind. 4,556,095, Cl. 160-166.00R.
Lewis, Harry D., to Union Camp Corporation. Use of humates in printing inks. 4,556,427, Cl. 106-20.000.
LGZ Landis & Gyr Zug AG: *See*—
Nyfeler, Alex; Gehr, Peter; Stalder, Martin; and Antes, Gregor, 4,556,378, Cl. 425-143.000.
Liao, Paul F.: *See*—
Glass, Alastair M.; and Liao, Paul F., 4,556,790, Cl. 250-211.00J.
Liberti, Frank N.; and Macke, Gerald F., to General Electric Company. Polycarbonate resin foam. 4,556,681, Cl. 521-90.000.
Libra, Fausto. Prefabricated multi-story building. 4,555,877, Cl. 52-79.400.
Liepert, Rudolf: *See*—
Marass, Josef; and Liepert, Rudolf, 4,555,989, Cl. 101-424.000.
Lift-U-Inc.: *See*—
Thorley, Graham R.; and Sullivan, Donald B., 4,556,128, Cl. 187-9.00R.
Lincoln Manufacturing Company, Inc.: *See*—
Bratton, Ronald E., 4,556,043, Cl. 126-21.00A.
Lindberg, Jarl J.; Era, Vaino ; and Strom, Erkki, to Ruoste-Esto Oy. Anti-rust agent, method of producing the same and method of preventing corrosion. 4,556,425, Cl. 106-14.230.
Lindblom, Kenneth A.: *See*—
Weber, Harold J.; Kuehnle, Manfred R.; Fraser, Kenneth D.; and Lindblom, Kenneth A., 4,556,309, Cl. 355-3.0TR.
Linden, Ludwig: *See*—
Kraemling, Franz; Muller, Achim; Linden, Ludwig; and Raedisch, Helmer, 4,556,600, Cl. 428-216.000.
Linder GmbH Fabrik Elektrischer Lampen und Apparate: *See*—
Becker, Klaus, 4,556,874, Cl. 340-638.000.
Link, Erich: *See*—
Lengsfeld, Karl; Link, Erich; and Erndt, Hans, 4,556,132, Cl. 192-12.0BA.
Lion Corporation: *See*—
Morita, Hiroshi; Kawada, Yasuyuki; Yamada, Junichi; and Ukigai, Toshiyuki, 4,556,108, Cl. 166-274.000.
Suganuma, Nobuo; Tanaka, Kensuke; Takada, Nobuyuki; and Ichikawa, Hiromichi, 4,556,553, Cl. 424-52.000.
Liou, Mou T. Combined tap and die holder. 4,556,348, Cl. 408-233.000.
Lipinski, Christopher A., to Pfizer Inc. Spiro-3-hetero-azolones for treatment of diabetic complications. 4,556,670, Cl. 514-390.000.
Litton Systems, Inc.: *See*—
Hiramatsu, Yukio, 4,556,854, Cl. 333-34.000.
Locher, Johannes: *See*—
Kniss, Helmut; and Locher, Johannes, 4,556,039, Cl. 123-569.000.
Lock, Charles R.: *See*—
Langmesser, Otto J., Jr.; Lock, Charles R.; and Wood, James C., 4,556,186, Cl. 248-429.000.
Lock Jaws, Inc.: *See*—
Ferraro, Thomas A., 4,556,228, Cl. 279-1.0SJ.
Lockery, Harry E.; and Freymiller, Edward, to Hottinger Baldwin Measurement, Inc. Method and means for equalizing the measuring

sensitivity of a plurality of strain gage transducers. 4,556,115, Cl. 177-211.000.

Lockheed Corporation: *See—*
Barish, Herman B., 4,556,347, Cl. 408-230.000.

Loctite Limited: *See—*
Harris, Stephen J.; McKervey, M. Anthony; Melody, David P.; Woods, John; and Rooney, John M., 4,556,700, Cl. 526-209.000.

Lodge, Philip G.: *See—*
Griggs, Colin G.; and Lodge, Philip G., 4,556,744, Cl. 568-487.000.

Logan, James H., to General Electric Company. Deflection yoke for small gun-base CRT. 4,556,857, Cl. 335-210.000.

Lohrey, Edwin J.; and Cho, Timothy C., to General Electric Company. Mounting structure and related method both for a multi-filament incandescent lamp. 4,556,822, Cl. 315-67.000.

Loizeau, Pierre, to Valeo. Torsion damping device. 4,556,135, Cl. 192-106.200.

LoMonte, Anthony F.: *See—*
Vartsky, David; Wielopolski, Lucian; LoMonte, Anthony F.; Ellis, Kenneth J.; and Cohn, Stanton H., 4,556,068, Cl. 128-719.000.

London, Alvan G., to Applied Power. Tilt lockout system for tilt-cab trucks. 4,556,118, Cl. 180-89.150.

Long, John V.: *See—*
Gagliani, John; and Long, John V., 4,556,682, Cl. 521-185.000.

Lonza Ltd.: *See—*
Quarroz, Daniel, 4,556,716, Cl. 546-345.000.

Lopez, David E.: *See—*
Prioste, Jerry E.; and Lopez, David E., 4,556,947, Cl. 364-550.000.

Lorenz, Kurt: *See—*
Weber, Heinrich; Lorenz, Kurt; Dungs, Horst; Bruns, Engelbert; and Osterholt, Gerd, 4,556,455, Cl. 201-39.000.

Lork, Winfried: *See—*
Erpenbach, Heinz; Gehrmann, Klaus; Lork, Winfried; and Prinz, Peter, 4,556,644, Cl. 502-33.000.

Losin, Martha S.: *See—*
Shenoy, Thirthahalli A.; and Losin, Martha S., 4,556,404, Cl. 62-17.000.

Lotterbach, Gerhard: *See—*
Gloss, Erwin; Lotterbach, Gerhard; Perenthaler, Egbert; Schenk, Manfred; Van Woudenberg, Jan F.; and Zucker, Udo, 4,556,036, Cl. 123-491.000.

Lotto, Sergio. Machine made of a set of equipment for the inspection and the maintenance of the lower surfaces of road and railway bridges, as well as viaducts and their respective piers. 4,556,124, Cl. 182-63.000.

Lowell, Freeman H. Method for developing and fixing latent fingerprints. 4,556,579, Cl. 427-1.000.

Lucas, August: *See—*
Bruns, Engelbert; and Lucas, August, 4,556,459, Cl. 202-263.000.

Lucas Industries Public Limited Company: *See—*
Farr, Glyn P. R., 4,556,261, Cl. 303-116.000.

Lucci, Robert, to Hoffmann-La Roche Inc. Preparation of 13-cis retinoic acid. 4,556,518, Cl. 260-413.000.

Ludvigsson, Bjorn M., to Boliden Aktiebolag. Method for continually controlling the quality of cathode copper. 4,555,942, Cl. 73-433.000.

Luk Lamellen und Kupplungsbau GmbH: *See—*
Huber, Lothar, 4,556,133, Cl. 192-70.160.

Lumma, William C., Jr.: *See—*
Erhardt, Paul W.; Hagedorn, Alfred A., III; Lumma, William C., Jr.; and Wohl, Ronald A., 4,556,665, Cl. 514-338.000.

Luna, Alberto A. H., to Vitro TEC Fideicomiso. Method and apparatus for the blowing and internal cooling of hollow articles of glass or other materials. 4,556,405, Cl. 65-82.000.

Lundman, Philip L. Method for manufacturing a jack stand. 4,556,163, Cl. 228-173.600.

Lyall Electric, Inc.: *See—*
Smith, Gregory A., 4,556,190, Cl. 249-99.000.

Lyutzkanov, Stoyan S.; and Bojkov, Dimiter K., to Stopansko Obedinenie "Quarz". Thermal insulation of industrial furnace crowns. 4,555,995, Cl. 110-335.000.

M/A-COM Omni Spectra, Inc.: *See—*
Hubbard, George M., 4,556,271, Cl. 339-94.00C.

M.A.N. Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft: *See—*
Knop, Klaus; and Heinrich, Peter, 4,556,421, Cl. 75-91.000.
Muser, Dieter; Raab, Norbert; and Deger, Johann, 4,556,529, Cl. 264-258.000.

Maag Gear-Wheel & Machine Company Limited: *See—*
Bloch, Peter; Schneider, Otto; and Donner, Meinrad, 4,555,871, Cl. 51-52.00R.

Macke, Gerald F.: *See—*
Liberti, Frank N.; and Macke, Gerald F., 4,556,681, Cl. 521-90.000.

Maclin, Harvey M.: *See—*
Wakeman, Thomas G.; and Maclin, Harvey M., 4,555,901, Cl. 60-39.320.

Maczenski, Stanislaw: *See—*
Bialy, Jan; Penczek, Irena; Maczenski, Stanislaw; and Borensztajn, Marek, 4,556,699, Cl. 526-68.000.

Maeda, Masaya; and Takei, Masahiro, to Canon Kabushiki Kaisha. Reproduction device. 4,556,920, Cl. 360-77.000.

Maehara, Toshifumi, to Akebono Brake Industry Company Ltd. Apparatus for preventing the locking of a wheel. 4,556,260, Cl. 303-116.000.

Maekawa, Motoi, to Tokyo Electric Co., Ltd. Electronic typewriter including right margin adjusting means. 4,556,332, Cl. 400-3.000.

Magna International, Inc.: *See—*
McKinnon, Greg E. J.; and Hoke, Arthur J., 4,555,870, Cl. 49-462.000.

Magnussen, Robert O., Jr. Fresh fruit package. 4,556,147, Cl. 206-493.000.

Mahaffey, John M. Portable electric generator for a vehicle. 4,556,247, Cl. 296-24.00R.

Maharaj, Kenrick B.: *See—*
Palfery, Kenneth J.; Malcolm, John S.; and Maharaj, Kenrick B., 4,555,844, Cl. 29-568.000.

Mahlein, Hans: *See—*
Mathyssek, Konrad; and Mahlein, Hans, 4,556,292, Cl. 350-394.000.

Mahnig, Fritz; and Meister, Herbert, to Georg Fischer Aktiengesellschaft. Cast wheel fork for motor vehicle axle. 4,556,234, Cl. 280-688.000.

Maidique, Modesto A.: *See—*
Brokaw, Adrian P.; and Maidique, Modesto A., 4,556,870, Cl. 340-347.0AD.

Maierson, Theodore, to Standard Register Company, The. Color developer for pressure-sensitive recording papers. 4,556,687, Cl. 524-333.000.

Maillard, Jacques G.; Van, Tri V.; Legeai, Jacky M.; and Benharkate, Marguerite M., to Laboratoires Jacques Logeais. 2-Imino-pyrrolidines, process for their preparation, and therapeutic compositions containing same. 4,556,674, Cl. 514-426.000.

Maki, Masao; Kaneko, Yasunori; and Fukuda, Hiroshi, to Matsushita Electric Industrial Co., Ltd. Solar heat collector. 4,556,048, Cl. 126-417.000.

Maki, Takao; Masuyama, Tetsuo; and Asahi, Yoshio, to Mitsubishi Chemical Industries Limited. Catalytic isomerization process of dimethylnaphthalenes. 4,556,751, Cl. 585-481.000.

Maki, Yoshihiro: *See—*
Oaku, Takaaki; Shioda, Masahiko; Suzuki, Syunsuke; and Maki, Yoshihiro, 4,556,533, Cl. 419-11.000.

Makihira, Hiroshi: *See—*
Kuni, Asahiro; Hamada, Toshimitsu; Makihira, Hiroshi; and Yoshimura, Kazushi, 4,556,797, Cl. 250-492.200.

Makino, Katsuhiko: *See—*
Kano, Takao; and Makino, Katsuhiko, 4,556,792, Cl. 250-231.0SE.

Makishima, Tatsuo: *See—*
Kusano, Chushirou; Ishioka, Sachio; Imamura, Yoshinori; Takasaki, Yukio; Ogawa, Hirofumi; Makishima, Tatsuo; Hirai, Tadaaki; and Maruyama, Eiichi, 4,556,817, Cl. 313-371.000.

Makuta, Yuri, heiress: *See—*
Uchida, Tatsu; Teshima, Toru; Wada, Masanobu, deceased; Wada, Masami, heir; and Makuta, Yuri, heiress, 4,556,286, Cl. 350-335.000.

Malakhov, Evgeny I.: *See—*
Aspiotis, Evgeny K.; Vitjuk, Boris Y.; Malakhov, Evgeny I.; Danshin, Boris V.; Sokolov, Vladimir A.; Sidorov, Anatoly S.; and Volkov, Leonid V., 4,556,847, Cl. 324-307.000.

Malcolm, John S.: *See—*
Palfery, Kenneth J.; Malcolm, John S.; and Maharaj, Kenrick B., 4,555,844, Cl. 29-568.000.

Malhi, Satwinder D. S., to Texas Instruments Incorporated. Method of fabricating density intensive non-self-aligned stacked CMOS. 4,555,843, Cl. 29-571.000.

Mallinckrodt, Inc.: *See—*
Bell, Alexis D., 4,556,566, Cl. 426-96.000.
Meyer, David R., 4,556,567, Cl. 426-96.000.
Meyer, David R., 4,556,568, Cl. 426-96.000.
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Manatt, Scott A., to Garrett Corporation, The. Fuel tank inerting system. 4,556,180, Cl. 244-135.00R.

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Fergason, James L., 4,556,289, Cl. 350-350.00R.

Mancuso, Paul, to Fiberlux, Inc. Vinyl tilt window assembly. 4,555,868, Cl. 49-181.000.

Mangogna, Joseph V. Mold for the manufacture of shoe soles. 4,556,191, Cl. 249-119.000.

Mankowski, Leonard E., to Cornell Research Foundation, Inc. Collapsible wall stud and building system. 4,555,889, Cl. 52-726.000.

Mannesmann AG: *See—*
Reth, Erich; and Hoenmanns, Wilhelm, 4,555,923, Cl. 72-250.000.

Mannesmann Rexroth GmbH: *See—*
Wolfges, Hans, 4,555,976, Cl. 91-420.000.

Manning, Philip H.: *See—*
Gwin, Richard B.; and Manning, Philip H., 4,556,162, Cl. 228-50.000.

Marass, Josef; and Liepert, Rudolf, to Georg Spiess GmbH. Apparatus for washing a rubber blanket cylinder of a printing machine. 4,555,989, Cl. 101-424.000.

Marathon Manufacturing Company: *See—*
Lewis, Harold M., 4,556,095, Cl. 160-166.00R.

Marazzi, Paolo: *See—*
Pedretti, Gaetano; and Marazzi, Paolo, 4,555,823, Cl. 12-77.000.

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le Mehaute, Alain; Hamaide, Thierry; Crepy, Gilles; and Marcellin, Georges, 4,556,614, Cl. 429-191.000.

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Grassi, Gino; Cammilli, Leonardo; Alcidi, Luciano; and Marconi, Paolo, 4,556,062, Cl. 128-419.0PG.

Marcoz, Jean: *See—*
Lecoffre, Yves; and Marcoz, Jean, 4,556,523, Cl. 261-123.000.

Maremont Corporation: *See*—
Cubalchini, Joseph, 4,556,092, Cl. 141-98.000.
Mareschal, Jean-Claude: *See*—
Collet-Cassart, Daniel; Mareschal, Jean-Claude; and Masson, Pierre L., 4,556,642, Cl. 436-500.000.
Marmarosi nee Kellner, Katalin: *See*—
Pongor nee Csakvari, Marianna; Nagy, Gabor; Horvath, Gabor; David nee Kenez, Maria; Bozsoky, Sandor; Virag, Sandor; and Marmarosi nee Kellner, Katalin, 4,556,563, Cl. 514-258.000.
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Aberg, Gunnar A. K.; Maroko, Peter R.; and af Ekenstam, Bo T., 4,556,664, Cl. 514-330.000.
Marr, Robert: *See*—
Wynnyckyj, John R.; Rhodes, Edward; and Marr, Robert, 4,556,019, Cl. 122-379.000.
Marshall, Anthony R.: *See*—
Couch, Alan T.; Cruickshank, Terence D.; Davey, William L. E.; Marshall, Anthony R.; Tydd, Christopher B.; and Wakeford, David R., 4,556,017, Cl. 122-4.00D.
Marshall, Stuart R., to Framelock International Pty. Limited. Connector for framing system. 4,556,337, Cl. 403-255.000.
Martel, Jacques; Tessier, Jean; and Demoute, Jean-Pierre, to Roussel Uclaf. Pentenoic acid and its preparation. 4,556,732, Cl. 562-577.000.
Martens, Alan; and Myers, Gerry A., to Westinghouse Electric Corp. Deaerator pressure control system for a combined cycle steam generator power plant. 4,555,906, Cl. 60-660.000.
Martin, August, to Pfaff Industriemaschinen GmbH. Sewing machine feed mechanism. 4,555,998, Cl. 112-121.120.
Martin, Hans; and Stuetz, Gerhard, to Sueddeutsche Kuehlerfabrik, Julius Fr. Behr GmbH & Co. KG. Fluid friction clutch. 4,556,138, Cl. 192-58.00B.
Martin, Jean Marcel, to Les Cables de Lyon. Method of manufacturing an insulant having a self reticulating cellular structure. 4,556,581, Cl. 427-29.000.
Martin, Joel L.: *See*—
Yeh, Gene H. C.; Martin, Joel L.; and Hsieh, Henry L., 4,556,647, Cl. 502-102.000.
Martin, John C., to Diesel Equipment Limited. Trip mechanism for de-activating elevator platforms. 4,556,129, Cl. 187-41.000.
Martin, John C.: *See*—
Verheyden, Julien P. H.; and Martin, John C., 4,556,659, Cl. 514-262.000.
Martin, Laverne D., to American Can Company. Laminated packaging material. 4,556,590, Cl. 428-35.000.
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Wetter, Hansjurg; Baumeister, Peter; Radimerski, Paul; and Martin, Pierre, 4,556,717, Cl. 548-262.000.
Martin, Ronald B.: *See*—
Chan, Dominic K.; Lee, Kwok P.; and Martin, Ronald B., 4,556,972, Cl. 370-60.000.
Martin, Ronald C. Method of making a prototype from concept drawings. 4,555,836, Cl. 29-428.000.
Martin, William A., to Eastman Kodak Company. Camera flash holder. 4,556,303, Cl. 354-141.000.
Martinez-Vera, Enrique R.; and Bustani-Adem, Alberto, to Hylsa, S.A. Process for the direct reduction of iron ores. 4,556,417, Cl. 75-35.000.
Maruyama, Eiichi: *See*—
Imamura, Yoshinori; Ataka, Saburo; Takasaki, Yukio; Tanaka, Yasuo; Hirai, Tadaaki; and Maruyama, Eiichi, 4,556,816, Cl. 313-366.000.
Kusano, Chushirou; Ishioka, Sachio; Imamura, Yoshinori; Takasaki, Yukio; Ogawa, Hirofumi; Makishima, Tatsuo; Hirai, Tadaaki; and Maruyama, Eiichi, 4,556,817, Cl. 313-371.000.
Masey, Johnny W.: *See*—
Tsang, Albert C.; Holland, Thomas L.; and Masey, Johnny W., 4,556,748, Cl. 568-858.000.
Mason, James S.; and Foerster, David, to Pneumo Corporation. Servo actuator control/damping mechanism and method. 4,555,974, Cl. 91-363.00A.
Masoncup, John F.; Peterson, Eric O.; and Peterson, Alan G., to Masoncup, John F. Padlock with tamper alarm. 4,556,872, Cl. 340-542.000.
Massachusetts Institute of Technology: *See*—
Fan, John C. C.; and Bachner, Frank J., 4,556,277, Cl. 350-1.700.
Masson, Pierre L.: *See*—
Collet-Cassart, Daniel; Mareschal, Jean-Claude; and Masson, Pierre L., 4,556,642, Cl. 436-500.000.
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Sugio, Akitoshi; Masu, Masanobu; and Kobayashi, Toshihiko, 4,556,685, Cl. 524-141.000.
Masuda, Michio: *See*—
Imaide, Takuya; Masuda, Michio; Okuda, Akihide; and Nishimura, Ryuji, 4,556,911, Cl. 358-212.000.
Masuda, Shunichi, to Canon Kabushiki Kaisha. Copying or printing apparatus. 4,556,310, Cl. 355-14.00R.
Masuda, Shunji; Nakaya, Hisashi; and Okazaki, Katumi, to Mazda Motor Corporation. Multiple-displacement engine. 4,556,026, Cl. 123-198.00F.
Masuyama, Tetsuo: *See*—
Maki, Takao; Masuyama, Tetsuo; and Asahi, Yoshio, 4,556,751, Cl. 585-481.000.
Mathyssek, Konrad; and Mahlein, Hans, to Siemens Aktiengesellschaft. Optical polarizer having a prism. 4,556,292, Cl. 350-394.000.
Matimura, Tugumi, to Itoki Kosakusho Co., Ltd. Guiding system for movable suspended partition walls. 4,555,828, Cl. 16-95.00R.
Matschinsky, Wolfgang, to Bayerische Motoren Werke Aktiengesellschaft. Independent wheel suspension for motor vehicles. 4,556,238, Cl. 280-701.000.
Matsuda, Yukio; Tachibana, Kenzo; and Ueno, Tsutomu, to Sumitomo Metal Industries, Ltd. Method and apparatus for controlling width and thickness of strip. 4,555,921, Cl. 72-224.000.
Matsukawa, Fumio: *See*—
Shimizu, Osamu; Goto, Hirofumi; and Matsukawa, Fumio, 4,556,876, Cl. 340-713.000.
Matsunawa, Masahiko, to Konishiroku Photo Industry Co., Ltd. Picture image discriminating apparatus. 4,556,916, Cl. 358-282.000.
Matsuo, Kazumasa: *See*—
Shishido, Yoshio; Nishigaki, Shinichi; Kato, Shinichi; Matsuo, Kazumasa; Miyazaki, Atsushi; Takahashi, Susumu; Nakamura, Takeaki; and Ishikawa, Akibumi, 4,556,787, Cl. 250-201.000.
Matsuoka, Hironao; and Suzuka, Kazuo, to Hitachi Denshi Kabushiki Kaisha. Radio system. 4,556,989, Cl. 455-183.000.
Matsura, Masataka: *See*—
Funada, Fumiaki; Matsura, Masataka; and Wada, Tomio, 4,556,287, Cl. 350-336.000.
Matsushita Electric Industrial Co., Ltd.: *See*—
Ishiwatari, Hiromasa, 4,556,875, Cl. 340-679.000.
Maki, Masao; Kaneko, Yasunori; and Fukuda, Hiroshi, 4,556,048, Cl. 126-417.000.
Neki, Shigeo; Shinozaki, Nozomu; and Morofuji, Takeshi, 4,556,001, Cl. 112-277.000.
Ozawa, Lyuji, 4,556,818, Cl. 313-395.000.
Sugawara, Norio; Nawa, Motoyuki; and Takahashi, Yutaka, 4,556,172, Cl. 239-590.500.
Tanaka, Kazuyuki, 4,556,879, Cl. 340-750.000.
Yoshiyuki, Takada; and Haruhisa, Tamura, 4,556,773, Cl. 219-10.55C.
Matsushita Electric Works, Ltd.: *See*—
Ando, Hiroyuki; Tanabe, Toshio; and Ihara, Shinji, 4,555,849, Cl. 30-388.000.
Fujishima, Nobuichi; and Ichikawa, Kuniharu, 4,556,782, Cl. 219-370.000.
Fukagawa, Hitoshi; Suzuki, Yoshiharu; and Komoda, Yoshiyuki, 4,556,865, Cl. 340-310.00R.
Yamada, Kiyoshi; and Murakami, Kazumasa, 4,556,873, Cl. 340-630.000.
Matsushita, Susumu; Tada, Yoshimitsu; Ikushige, Tetsuo; and Baba, Nobuyuki, to Toyo Soda Manufacturing Co., Inc. Chromatographic apparatus. 4,556,538, Cl. 422-70.000.
Matsushita, Yoshikazu; Takei, Masaki; Yonekubo, Masatoshi; and Nishiwaki, Tsutomu, to Kabushiki Kaisha Suwa Seikosha. Printing apparatus and method. 4,556,891, Cl. 346-76.0PH.
Matsuura, Naosuke: *See*—
Koda, Akihide; Hori, Mikio; Matsuura, Naosuke; Yasumoto, Mitsugi; Yamawaki, Ichiro; Ueda, Shuichi; and Tada, Yukio, 4,556,737, Cl. 564-218.000.
Mauldin, Charles H.; and Payne, Virgil L., to Exxon Research and Engineering Co. Preparation of liquid hydrocarbons from methanol. 4,556,752, Cl. 585-640.000.
Mauleon, Jean-Louis; Newman, Robert J.; and Black, Alan J., to Total Engineering and Research Company. Method for the clean-up of particulate-catalyst containing gases. 4,556,479, Cl. 208-164.000.
Maurer, Donald D., to EMPI, Inc. Method and apparatus for healing tissue. 4,556,051, Cl. 128-1.500.
Max-Planck-Gesellschaft zur Forderung der/Wissenschaften e.V.: *See*—
Fischer, Herbert; Kickhofen, Botho; and Vaubel, Eckehard, 4,556,056, Cl. 128-156.000.
Mazda Motor Corporation: *See*—
Masuda, Shunji; Nakaya, Hisashi; and Okazaki, Katumi, 4,556,026, Cl. 123-198.00F.
Morita, Yasuyuki, 4,556,025, Cl. 123-198.00F.
McBee, Gerald. Door hinge aligning tool and method. 4,555,929, Cl. 72-458.000.
McBrien, Gregory J., to United Technologies Corporation. Serial to parallel data conversion circuit. 4,556,850, Cl. 328-72.000.
McCabe, Francis J. Damper operator for use with air, smoke and fire dampers. 4,555,981, Cl. 98-1.000.
McCall, John M., to Upjohn Company, The. 2-Benzoxepins. 4,556,656, Cl. 514-227.000.
McCammon, Patrick R.; Blackburn, Louis W.; and Hershberger, Bernard J., to Amana Refrigeration, Inc. Microwave oven cavity air flow system. 4,556,772, Cl. 219-10.55F.
McCarthy, John P.: *See*—
Kaufman, Harold B., Jr.; McCarthy, John P.; Entner, Bernard J.; and Wallenfels, Kurt, 4,556,572, Cl. 426-289.000.
McCaskie, John E.: *See*—
Tsiamis, Chris; and McCaskie, John E., 4,556,587, Cl. 427-304.000.
McCord, James W. Safety control device for vapor generating and recovering apparatus. 4,556,457, Cl. 202-206.000.
McCord, James W.: *See*—
Ruckriegel, Michael J.; and McCord, James W., 4,556,456, Cl. 202-186.000.
McCormick, Dennis J., to Vercon, Inc. Apparatus for attaching container ends to container bodies. 4,556,445, Cl. 156-423.000.
McCready, Russell J.; and Tyrell, John A., to General Electric Company. Thermoplastic polyetherimide ester elastomers. 4,556,688, Cl. 525-33.000.
McCready, Russell J., to General Electric Company. Thermoplastic polyetherimide ester elastomers. 4,556,705, Cl. 528-289.000.

McDonnell Douglas Corporation: *See*—
Palfery, Kenneth J.; Malcolm, John S.; and Maharaj, Kenrick B., 4,555,844, Cl. 29-568.000.

McElroy, James G. Combustion furnace and burner. 4,556,386, Cl. 432-149.000.

McEuen, Albert H.: *See*—
Vaguine, Victor A.; Giebeler, Robert H., Jr.; and McEuen, Albert H., 4,556,070, Cl. 128-804.000.

McGann, Leo E.: *See*—
Sedlatschek, Robert; and McGann, Leo E., 4,556,594, Cl. 428-83.000.

McHugh, Patricia P.: *See*—
Brewer, James A.; Eggebrecht, Lewis C.; Kummer, David A.; and McHugh, Patricia P., 4,556,952, Cl. 364-900.000.

McKendrick, Roderick W. Prosthetic foot and ankle joint. 4,555,817, Cl. 623-40.000.

McKenna, Charles M.; Clark, William M., Jr.; and Seliger, Robert L., to Hughes Aircraft Company. Focused ion beam column. 4,556,798, Cl. 250-492.200.

McKenna, James E.; and Plocek, Thomas, to Chem-Fleur International, Inc. Selective decarbonylation process. 4,556,743, Cl. 568-433.000.

McKervey, M. Anthony: *See*—
Harris, Stephen J.; McKervey, M. Anthony; Melody, David P.; Woods, John; and Rooney, John M., 4,556,700, Cl. 526-209.000.

McKinnon, Greg E. J.; and Hoke, Arthur J., to Magna International, Inc. Door edge guard trim. 4,555,870, Cl. 49-462.000.

McLin, Marvin R., to McWhorter, Lynn. Battery box hold-down. 4,556,187, Cl. 248-503.000.

McNaul, William F., to Cubic Corporation. Polarization measurement system and method. 4,556,888, Cl. 343-362.000.

McNulty, Hugh, Jr.: *See*—
Ward, James W.; Schlanger, Herbert; McNulty, Hugh, Jr.; and Parker, Norman W., 4,556,794, Cl. 250-309.000.

McWhorter, Lynn: *See*—
McLin, Marvin R., 4,556,187, Cl. 248-503.000.

Meatto, Franklin D.; and Pilpel, Edward D., to Olin Corporation. Alpine ski with selective reinforcement. 4,556,237, Cl. 280-610.000.

Meddles, Dennis, to International Rectifier Corporation. Lead frame structure. 4,556,896, Cl. 357-70.000.

Medtronic, Inc.: *See*—
Thompson, David L.; Bennett, Robert M.; and Roline, Glenn M., 4,556,063, Cl. 128-419.0PT.

Megatech Corporation: *See*—
Haldeman, Charles W., 4,556,101, Cl. 165-45.000.

Megna, Ignazio S.; and Franz, Curtis A., to American Cyanamid Company. Low heat buildup polyurethane compositions and articles. 4,556,703, Cl. 528-49.000.

Meidai Bussan Kabushiki Kaisha: *See*—
Kobayashi, Nobuo, 4,556,248, Cl. 296-183.000.

Meiji Seika Kaisha, Ltd.: *See*—
Shibahara, Seiji; Okonogi, Tsuneo; Murai, Yasushi; Fukatsu, Shunzo; Niida, Taro; and Wakazawa, Tadashi, 4,556,513, Cl. 260-239.00A.

Meinecke, Albrecht, to J. M. Voith GmbH. Apparatus for cleaning paper making machine screen belts. 4,556,453, Cl. 162-274.000.

Meinershagen, Charles I. Vehicle direction signal and slow warning system employing moving pattern of simultaneously ON lamps. 4,556,862, Cl. 340-67.000.

Meise, William H.: *See*—
Dischert, Robert A.; and Meise, William H., 4,556,906, Cl. 358-180.000.

Meister, Herbert: *See*—
Mahnig, Fritz; and Meister, Herbert, 4,556,234, Cl. 280-688.000.

Melamed, Stephen B.: *See*—
Geneve, Francois M.; Heiligenstein, Luc M. D.; and Melamed, Stephen B., 4,556,253, Cl. 297-440.000.

Melanson, Joseph: *See*—
Nakata, Nori; and Melanson, Joseph, 4,555,893, Cl. 53-390.000.

Melody, David P.: *See*—
Harris, Stephen J.; McKervey, M. Anthony; Melody, David P.; Woods, John; and Rooney, John M., 4,556,700, Cl. 526-209.000.

Melzer, Hans-Harald; and Spindebock, Wolf-Dieter, to Bayerische Motoren Werke AG. Arrangement of an exhaust-gas return system for an internal-combustion engine having an exhaust-gas turbosupercharger. 4,555,904, Cl. 60-605.000.

Memorex Corporation: *See*—
Rose, Andrew M., 4,556,921, Cl. 360-77.000.

Menard, Paul: *See*—
Suh, John T.; Skiles, Jerry W.; Piwinski, John J.; Menard, Paul; and Jones, Howard, 4,556,652, Cl. 514-211.000.

Mendoza, Joe, to Purex Pool Products, Inc. Underwater light assembly with annularly flared re-entrant wall and sealing means. 4,556,933, Cl. 362-267.000.

Mennicke, Stefan; and Reiss, Karl, to Brown, Boveri & Cie AG. Method for the manufacture of an electrochemical storage cell as well as a storage cell produced by this method. 4,555,846, Cl. 29-623.500.

Mercy, Brian R., to International Business Machines Corporation. Multiplier speed improvement by skipping carry save adders. 4,556,948, Cl. 364-757.000.

Merket, Lesley. Circulating water filtering system and method of operation. 4,556,486, Cl. 210-170.000.

Mertz, Bruno: *See*—
Bricot, Claude; Berthet, Pierre; Mertz, Bruno; and Gerard, Jean-Louis, 4,556,966, Cl. 369-52.000.

Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung: *See*—
Fischer, Thomas, 4,555,961, Cl. 74-579.00E.

Messier-Hispano-Bugatti (S.A.): *See*—
Veaux, Jacques; and Derrien, Michel, 4,556,179, Cl. 244-102.00R.

Metallgesellschaft Aktiengesellschaft: *See*—
Rudolph, Paul; and Hirsch, Martin, 4,556,402, Cl. 48-197.00R.

Metatech Corporation: *See*—
Perlin, Alfred R., 4,556,060, Cl. 128-325.000.

Metzger, Karl G.: *See*—
Grohe, Klaus; Petersen, Uwe; Zeiler, Hans-Joachim; and Metzger, Karl G., 4,556,658, Cl. 514-254.000.
Grohe, Klaus; Zeiler, Hans-Joachim; and Metzger, Karl G., 4,556,709, Cl. 544-117.000.

Meuer, Johannes; Nemack, Christian; and Todtenhaupt, Dieter, to Willy Vogel Ag. Device for controlling the function of central lubrication installations. 4,556,766, Cl. 200-81.90R.

Meuli, Michael G., to Kimberly-Clark Corporation. Method for adhering tensioned elastic strips to a flexible base material and article produced therefrom. 4,556,596, Cl. 428-152.000.

Meyer, David R., to Mallinckrodt, Inc. Salt substitute containing potassium chloride coated with maltodextrin and method of preparation. 4,556,567, Cl. 426-96.000.

Meyer, David R., to Mallinckrodt, Inc. Salt substitute containing potassium chloride coated with a mixture including maltodextrin and potassium bitartrate and method of preparation. 4,556,568, Cl. 426-96.000.

Meyer, David R., to Mallinckrodt, Inc. Admixture of potassium chloride and maltodextrin as salt substitute and method of preparation. 4,556,577, Cl. 426-649.000.

Meyer, David R., to Mallinckrodt, Inc. NaCl-Free salt substitute containing potassium chloride, maltodextrin and potassium bitartrate and method of preparation. 4,556,578, Cl. 426-649.000.

Mezger, Hans: *See*—
Anklam, Bruno; Koenneker, Reinhard; and Mezger, Hans, 4,556,034, Cl. 123-470.000.

Miceli, Philip V. Knife system with removable-accessory handle lock. 4,555,822, Cl. 7-119.000.

Michael Geiseler DBF-Vertriebs-GmbH: *See*—
Oberbach, Josef, 4,556,757, Cl. 174-35.00R.

Michaels, Michael: *See*—
Barlow, Joel H.; and Michaels, Michael, 4,556,586, Cl. 427-282.000.

Micropore International Limited: *See*—
Hughes, John T., 4,556,593, Cl. 428-72.000.

Miles Laboratories, Inc.: *See*—
Gantzer, Mary Lou, 4,556,640, Cl. 436-66.000.

Milkovic, Miran; and Bogacki, Anthony P., to General Electric Company. Electronic solid state Q-hour meter and/or combination Q-hour and kilowatt-hour meter. 4,556,843, Cl. 324-107.000.

Miller, Bernard F.: *See*—
VanLoon, Donald F.; and Miller, Bernard F., 4,556,223, Cl. 277-118.000.

Miller, Gary M., to Owens-Corning Fiberglas Corporation. Roving winder controller. 4,556,176, Cl. 242-38.000.

Miller, Richard F.; and Nicholson, Michael P., to Atlantic Richfield Company. Method for minimizing fouling of heat exchanger. 4,556,476, Cl. 208-48.0AA.

Miller, Robert J., to Colt Industries Operating Corp. Adapter means for creating an open loop manually adjustable apparatus and system for selectively controlling the air-fuel ratio supplied to a combustion engine. 4,556,032, Cl. 123-438.000.

Miller, Walter E., Jr.; Westrich, Richard G., Jr.; and Jones, Michael M., to United States of America, Army. Short range optical rangefinder. 4,556,313, Cl. 356-1.000.

Miller, William S.: *See*—
Dickerson, Richard C.; and Miller, William S., 4,556,492, Cl. 210-668.000.

Millington, Michael J., to Parsons Controls Limited. Chain components. 4,556,246, Cl. 294-82.110.

Mills, William R.: *See*—
Allen, Linus S.; and Mills, William R., 4,556,793, Cl. 250-267.000.

Mima, Hiroshi, to Murata Kikai Kabushiki Kaisha. Spun yarn splicing device. 4,555,899, Cl. 57-22.000.

Miner Enterprises: *See*—
Carlstedt, Richard A., 4,556,149, Cl. 213-34.000.

Mineral Separation Corporation: *See*—
Kuhn, Martin C.; and Zeitz, Vernon, 4,556,467, Cl. 204-193.000.

Minnesota Mining and Manufacturing Company: *See*—
Heilmann, Steven M.; Krepski, Larry R.; and Rasmussen, Jerald K., 4,556,723, Cl. 556-413.000.
Jensen, Steven C., 4,556,307, Cl. 355-3.00R.
Rinehart, Thomas A.; Willson, Richard F.; and Halling, Vaughn W., 4,556,893, Cl. 346-135.100.
Ronning, Patricia M.; and Vandesteeg, Gregg A., 4,556,410, Cl. 71-78.000.
Siedle, Allen R.; and Howells, Richard D., 4,556,720, Cl. 556-22.000.

Minolta Camera Kabushiki Kaisha: *See*—
Hashimoto, Kaoru; and Nagata, Kenzo, 4,556,779, Cl. 219-216.000.

Minz, Franz-Rudolf; and Vajna, Sandor, to Bayer Aktiengesellschaft. Process for removing sulphate from electrolysts brine. 4,556,463, Cl. 204-98.000.

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Missick, Kenneth P.: *See*—
Chapman, Athol W.; Cope, Fred E.; and Missick, Kenneth P., 4,556,250, Cl. 297-192.000.
Mistral Windsurfing AG: *See*—
Prade, Ernstfried, 4,556,003, Cl. 114-39.000.
Mitsubishi Chemical Industries Limited: *See*—
Maki, Takao; Masuyama, Tetsuo; and Asahi, Yoshio, 4,556,751, Cl. 585-481.000.
Mitsubishi Denki Kabushiki Kaisha: *See*—
Hagino, Hiroyasu, 4,556,898, Cl. 357-71.000.
Ichikawa, Toru, 4,556,957, Cl. 364-171.000.
Kanto, Noriharu; Hosaka, Yukihiro; Sasaki, Yoshio; Kuramoto, Tatsuo; and Kimura, Masato, 4,555,914, Cl. 62-380.000.
Katoo, Hisashi; Fujiwara, Kunio; and Kawashima, Yoshikazu, 4,556,940, Cl. 364-424.000.
Nishigaki, Haruo; Watanabe, Koji; Fukui, Shiroh; and Kanematsu, Kiyoshi, 4,556,511, Cl. 252-573.000.
Shimizu, Osamu; Goto, Hirofumi; and Matsukawa, Fumio, 4,556,876, Cl. 340-713.000.
Taniguti, Ryosuki, 4,556,946, Cl. 364-481.000.
Mitsubishi Gas Chemical Company, Inc.: *See*—
Isshiki, Tomiya; Kijima, Yasuhiko; Miyauchi, Yuh; and Kondo, Takao, 4,556,519, Cl. 260-549.000.
Sugio, Akitoshi; Masu, Masanobu; and Kobayashi, Toshihiko, 4,556,685, Cl. 524-141.000.
Mitsubishi Jidosha Kogyo Kabushiki Kaisha: *See*—
Kumagai, Naotake; Saga, Ikuo; Tatemoto, Minoru; and Tada, Tetsuya, 4,556,877, Cl. 340-713.000.
Shimizu, Osamu; Goto, Hirofumi; and Matsukawa, Fumio, 4,556,876, Cl. 340-713.000.
Mitsubishi Rayon Co., Ltd.: *See*—
Kishida, Kazuo; Yamamoto, Naoki; and Sato, Yasumasa, 4,556,692, Cl. 525-78.000.
Mitsui Engineering & Shipbuilding Co., Ltd.: *See*—
Endou, Hajime, 4,555,905, Cl. 60-659.000.
Mitsui Petrochemical Industries, Ltd: *See*—
Nakagawa, Mikio, 4,556,690, Cl. 525-64.000.
Mitsui Sugar Co., Ltd.: *See*—
Takazoe, Ichiro; Ohta, Kosei; Shimizu, Junichi; Suzuki, Kazumasa; Iwakura, Tatsuya; and Nakajima, Yoshikazu, 4,556,429, Cl. 127-30.000.
Mitsui Toatsu Chemicals, Inc.: *See*—
Kawashima, Saburo; and Yamaguchi, Akihiro, 4,556,738, Cl. 564-329.000.
Miya, Shuichi: *See*—
Ohbayashi, Nobuo; Kawata, Akiho; Miya, Shuichi; and Niinuma, Teruhisa, 4,556,604, Cl. 428-323.000.
Miyamoto, Hirofumi; Kaitatsu, Nobuaki; Sugitani, Junichi; Taniguchi, Yasumaru; and Kaji, Tetsuo, to Kubota, Ltd.; and Osaka Gas Company, Limited. Method of ultrasonic flaw detection of pipe. 4,555,948, Cl. 73-640.000.
Miyauchi, Toshimitsu: *See*—
Tsunoda, Yoshito; Miyauchi, Toshimitsu; and Shigematsu, Kazuo, 4,556,965, Cl. 369-45.000.
Miyauchi, Yuh: *See*—
Isshiki, Tomiya; Kijima, Yasuhiko; Miyauchi, Yuh; and Kondo, Takao, 4,556,519, Cl. 260-549.000.
Miyazaki, Atsushi: *See*—
Shishido, Yoshio; Nishigaki, Shinichi; Kato, Shinichi; Matsuo, Kazumasa; Miyazaki, Atsushi; Takahashi, Susumu; Nakamura, Takeaki; and Ishikawa, Akibumi, 4,556,787, Cl. 250-201.000.
Miyazaki, Kenji: *See*—
Sato, Ken-ichi; Takano, Satoshi; and Miyazaki, Kenji, 4,556,609, Cl. 428-659.000.
Miyoshi, Yoshihiro: *See*—
Kawai, Kiyoshi; Kokubo, Toshiyuki; and Miyoshi, Yoshihiro, 4,556,648, Cl. 502-112.000.
Mizushina, Masaaki: *See*—
Yamada, Takemi; Satoh, Tamataro; Mizushina, Masaaki; Toyota, Koji; and Okamoto, Hiromi, 4,556,022, Cl. 123-188.0AA.
Mizutani, Hikaru: *See*—
Takagi, Hiroyoshi; Amaike, Toshiyuki; and Mizutani, Hikaru, 4,556,153, Cl. 220-334.000.
Mobil Oil Corporation: *See*—
Allen, Linus S.; and Mills, William R., 4,556,793, Cl. 250-267.000.
Cheruvu, Subrahmanyam, 4,556,545, Cl. 423-167.000.
Dwyer, Francis G., 4,556,477, Cl. 208-111.000.
Horodysky, Andrew G.; and Gemmill, Robert M., Jr., 4,556,497, Cl. 252-51.50A.
Valyocsik, Ernest W., 4,556,549, Cl. 423-326.000.
Mochida, Shigeru; Kojima, Masaru; and Kitagawa, Jun, to NGK Insulators, Ltd. Ceramic honeycomb catalytic converters having high thermal shock resistance. 4,556,543, Cl. 422-171.000.
Moeller, Robert P.: *See*—
Burns, William K.; and Moeller, Robert P., 4,556,293, Cl. 350-400.000.
Moffitt, Gregory A.; and Brown, Glenn E. Moisture guard for window frames, door jambs and the like. 4,555,882, Cl. 52-204.000.
Mogami, Takao; and Kawashima, Hiroshi, to Kabushiki Kaisha Suwa Seikosha. Photochromic coating composition and photochromic synthetic resin ophthalmic lens. 4,556,605, Cl. 428-331.000.
Mohr, Adolf: *See*—
Beisse, Achim; Harer, Helmut; Mohr, Adolf; and Schustek, Siegfried, 4,556,809, Cl. 310-114.000.
Molee, Casper S., to Victory Engineering Corporation. Method of diffusing silicon slices with doping materials. 4,556,437, Cl. 148-188.000.
Moll, Manfred: *See*—
Romer, Rudolf; Jaeneke, Christian; Bethmann, Karl W.; and Moll, Manfred, 4,555,971, Cl. 89-1.110.
Monarch Marking Systems, Inc.: *See*—
Torbeck, Daniel J., 4,556,442, Cl. 156-350.000.
Monat, Robert A., to RCA Corporation. Teletext system having user prompt commands. 4,556,904, Cl. 358-147.000.
Monsanto Company: *See*—
Franz, John E.; and Zwikelmaier, Kurt E., 4,556,415, Cl. 71-100.000.
Montavon, Francois: *See*—
Dorn, Franz; Montavon, Francois; and Suchy, Milos, 4,556,661, Cl. 514-277.000.
Montefina S.A.: *See*—
Castelein, Jean, 4,556,691, Cl. 525-71.000.
Morgan, Paul W.; Ellwood, Thomas J.; Amlani, Kish D.; and Hodges, John B., to Eaton Corporation. Combination loading transducer. 4,555,955, Cl. 73-862.060.
Mori, Kei. Chlorella nurturing device. 4,555,864, Cl. 47-1.400.
Mori, Kei. Light radiation device and method for trapping fish. 4,556,930, Cl. 362-32.000.
Morin, Marius J.; and Munro, Jack C., to Associated Medical Systems, Inc. Dental flossing tool. 4,556,074, Cl. 132-92.00R.
Morishima, Masayuki: *See*—
Tazima, Yoshihisa; Morishima, Masayuki; Okumura, Hiroshi; and Kasahara, Shin-ichi, 4,556,770, Cl. 219-10.49R.
Morita, Hiroshi; Kawada, Yasuyuki; Yamada, Junichi; and Ukigai, Toshiyuki, to Lion Corporation. Micellar slug for oil recovery. 4,556,108, Cl. 166-274.000.
Morita, Tatsuo: *See*—
Yamaguchi, Hiroshi; Sawamoto, Kunifumi; Sanbuichi, Hiroshi; Morita, Tatsuo; and Takizawa, Satoshi, 4,556,029, Cl. 123-41.150.
Morita, Yasuyuki, to Mazda Motor Corporation. Engine valve mechanism having valve disabling device. 4,556,025, Cl. 123-198.00F.
Morofuji, Akihiko: *See*—
Taira, Kazuo; Morofuji, Akihiko; Kobayashi, Seishichi; and Ueno, Hiroshi, 4,556,151, Cl. 220-67.000.
Morofuji, Takeshi: *See*—
Neki, Shigeo; Shinozaki, Nozomu; and Morofuji, Takeshi, 4,556,001, Cl. 112-277.000.
Morris, Lyle E., to Xerox Corporation. Print wheel mounting means. 4,556,335, Cl. 400-144.200.
Morrison, Donald R. Rotary trowel blade assembly. 4,556,339, Cl. 404-112.000.
Morton, Arthur W., to Conoco Inc. Method and apparatus for production of subsea hydrocarbons using a floating vessel. 4,556,340, Cl. 405-195.000.
Morton Thiokol, Inc.: *See*—
Poulin, Susan B.; and Salamone, Ann B., 4,556,629, Cl. 430-331.000.
Motorenfabrik Hatz GmbH & Co. KG: *See*—
Anetzberger, Max; and Eder, Erich, 4,556,021, Cl. 123-185.00S.
Motorola, Inc.: *See*—
Dewitt, B. Chris, 4,556,804, Cl. 307-296.00R.
Genrich, Thad J., 4,556,984, Cl. 377-47.000.
Olivera, Raul, 4,556,274, Cl. 339-147.00R.
Prioste, Jerry E.; and Lopez, David E., 4,556,947, Cl. 364-550.000.
Motoyama, Shimesu; Kurita, Kaora; Sakashita, Shizuka; Takei, Narimichi; and Ohno, Shigeru, to Freund Industrial Co., Ltd. Granulating and coating machine. 4,556,175, Cl. 241-57.000.
Motzer, Helmut, to Herion-Werke KG. Hydraulic control circuit for controlling and monitoring operating pressure in a hydraulic consumer device. 4,555,977, Cl. 91-446.000.
Moufflet, Luc: *See*—
Laurenceau, Serge; Moufflet, Luc; and Genies, Bernerd, 4,556,384, Cl. 431-160.000.
Mouille, Rene L.; and Leman, Jean-Luc M., to Societe Nationale Industrielle et Aerospatiale. Hub plate for a helicopter rotor, method of manufacturing it, and a helicopter rotor hub equipped with plates. 4,556,365, Cl. 416-134.00A.
Moya, Edward J., to Avery International Corporation. Air shuttle label dispenser. 4,556,443, Cl. 156-356.000.
Mueller, Claus D.: *See*—
Binnig, Fritz; Mueller, Claus D.; Raschack, Manfred; and von Philipsborn, Gerda, 4,556,662, Cl. 514-300.000.
Muller, Achim: *See*—
Kraemling, Franz; Muller, Achim; Linden, Ludwig; and Raedisch, Helmer, 4,556,600, Cl. 428-216.000.
Muller, Karl-Heinz: *See*—
Krude, Werner; Muller, Karl-Heinz; and Welschof, Hans-Heinrich, 4,556,400, Cl. 464-181.000.
Muller, Reinhard: *See*—
Cirkel, Hans-Jurgen; Bette, Willi; and Muller, Reinhard, 4,556,981, Cl. 372-86.000.
Muller, Rolf, to Gustav Mueller GmbH und Co. KG. Medical instrument with internal light source for illuminating body cavities. 4,556,052, Cl. 128-11.000.
Muller, Rudolph R. M., to Multifastener Corp. Method of installing self-attaching fasteners. 4,555,838, Cl. 29-432.100.
Multi-Arc Vacuum Systems Inc.: *See*—
Bergman, Clark; Vergason, Gary E.; Allen, William; and Reed, Michael F., 4,556,471, Cl. 204-298.000.
Multifastener Corp.: *See*—
Muller, Rudolph R. M., 4,555,838, Cl. 29-432.100.

Mulvey, Dennis M.: *See*—
Kanojia, Ramesh M.; Bandurco, Victor T.; Levine, Seymour D.; Mulvey, Dennis M.; and Tobia, Alfonso J., 4,556,739, Cl. 564-443.000.

Munde, Jan C.; and Laigar, Karl, to Alfa-Laval Separation AB. Suspension device for rotary spindle. 4,556,331, Cl. 384-453.000.

Munro, Jack C.: *See*—
Morin, Marius J.; and Munro, Jack C., 4,556,074, Cl. 132-92.00R.

Murai, Yasushi: *See*—
Shibahara, Seiji; Okonogi, Tsuneo; Murai, Yasushi; Fukatsu, Shunzo; Niida, Taro; and Wakazawa, Tadashi, 4,556,513, Cl. 260-239.00A.

Murakami, Kazumasa: *See*—
Yamada, Kiyoshi; and Murakami, Kazumasa, 4,556,873, Cl. 340-630.000.

Murakami, Yoshiaki; Shiba, Kunio; Yoshitake, Akira; Takahashi, Keietsu; Ueda, Nobuo; and Hazue, Masaaki, to Sumitomo Chemical Company, Limited. Complex of biologically active protein with reactive high polymer having bonded thereto bifunctional chelate. 4,556,689, Cl. 525-54.100.

Muramoto, Yutaka: *See*—
Kobayashi, Susumu; Muramoto, Yutaka; Ishizaka, Hideo; and Ishii, Yoshinori, 4,556,837, Cl. 320-2.000.

Murasaki, Norio: *See*—
Tomibe, Shinji; and Murasaki, Norio, 4,556,508, Cl. 252-518.000.

Murata, Katsuaki: *See*—
Harada, Kosuke; Murata, Katsuaki; and Nakamizo, Takazi, 4,556,802, Cl. 307-66.000.

Murata Kikai Kabushiki Kaisha: *See*—
Mima, Hiroshi, 4,555,899, Cl. 57-22.000.

Murata Manufacturing Co. Ltd.: *See*—
Tanaka, Yukio; and Chigodo, Yoshikazu, 4,556,929, Cl. 361-321.000.

Musashi Engineering Kabushiki Kaisha: *See*—
Nogi, Hiroyoshi; and Tanaka, Shigeru, 4,556,212, Cl. 271-315.000.

Muser, Dieter; Raab, Norbert; and Deger, Johann, to M.A.N. Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft. Method for bonding molded components sheeting or shaped members. 4,556,529, Cl. 264-258.000.

Mutchler, David K.: *See*—
Hunter, Charles L.; Fuller, Payton D.; and Mutchler, David K., 4,556,484, Cl. 210-90.000.

Myers, Gerry A.: *See*—
Martens, Alan; and Myers, Gerry A., 4,555,906, Cl. 60-660.000.

Nadeau, John F., Jr.; and Varvaro, Alexander J., to Firestone Tire & Rubber Company, The. Die assembly for tire tread extrudate. 4,556,382, Cl. 425-462.000.

Nagamine, Yoshibumi: *See*—
Saito, Taro; Umeki, Kazumi; Ohno, Takaaki; Sakane, Hirobumi; Tsujino, Masahide; Sanpei, Keiichi; Nagamine, Yoshibumi; and Sato, Yoshitaka, 4,556,113, Cl. 172-91.000.

Nagaraj, D. R., to American Cyanamid Company. Process for the flotation of base metal sulfide minerals in acid, neutral or mildly alkaline circuits. 4,556,482, Cl. 209-166.000.

Nagata, Kenzo: *See*—
Hashimoto, Kaoru; and Nagata, Kenzo, 4,556,779, Cl. 219-216.000.

Nagata, Sumio; Kanaiwa, Kazuhide; and Ichikawa, Takashi, to Director-General of the Agency of Industrial Science and Technology; and Shachihata Kogyo K.K. Method for the preparation of a spongy metallic body. 4,556,096, Cl. 164-79.000.

Nagel, Dietmar: *See*—
Arad, Avi; Kennedy, Melvin R.; and Nagel, Dietmar, 4,556,397, Cl. 446-436.000.
Kennedy, Melvin R.; Nagel, Dietmar; and Arad, Abraham, 4,556,396, Cl. 446-23.000.

Nagy, Gabor: *See*—
Pongor nee Csakvari, Marianna; Nagy, Gabor; Horvath, Gabor; David nee Kenez, Maria; Bozsoky, Sandor; Virag, Sandor; and Marmarosi nee Kellner, Katalin, 4,556,563, Cl. 514-258.000.

Naito, Hideki: *See*—
Sato, Kozo; Fujita, Shinsaku; Nakamura, Koichi; and Naito, Hideki, 4,556,632, Cl. 430-562.000.

Naito. Tatsuro: *See*—
Ueno, Masato; Sato, Masayoshi; Tasaka, Mitsuyuki; and Naito, Tatsuro, 4,556,389, Cl. 433-206.000.

Nakacawa Seisakusho Co., Ltd.: *See*—
Kurata, Yoshiharu, 4,556,000, Cl. 112-222.000.

Nakada, Tomihiro: *See*—
Ogata, Naoya; Sanui, Kohei; Azuma, Chiaki; Tanaka, Hozumi; Oguchi, Kiyoshi; Takahashi, Yoichi; and Nakada, Tomihiro, 4,556,619, Cl. 430-17.000.

Nakagawa, Mikio, to Mitsui Petrochemical Industries, Ltd. Acetal resin composition. 4,556,690, Cl. 525-64.000.

Nakahara, Akihiro: *See*—
Tominaga, Ichiro; and Nakahara, Akihiro, 4,556,220, Cl. 273-218.000.

Nakai, Ryusuke, to Sumitomo Electric Industries, Ltd. Method for controlling vertically arranged heaters in a crystal pulling device. 4,556,784, Cl. 219-425.000.

Nakajima, Kaoru, to Sony Corporation. Magnetic recording medium. 4,556,611, Cl. 428-694.000.

Nakajima, Yoshikazu: *See*—
Takazoe, Ichiro; Ohta, Kosei; Shimizu, Junichi; Suzuki, Kazumasa; Iwakura, Tatsuya; and Nakajima, Yoshikazu, 4,556,429, Cl. 127-30.000.

Nakamizo, Takazi: *See*—
Harada, Kosuke; Murata, Katsuaki; and Nakamizo, Takazi, 4,556,802, Cl. 307-66.000.

Nakamoto, Keiji: *See*—
Tamura, Shohei; Sasaki, Sadamitsu; Sasaki, Takeshi; Ichinose, Hisashi; Nakamoto, Keiji; Abe, Masao; and Nakazawa, Hitoshi, 4,556,623, Cl. 430-83.000.

Nakamura, Iwao, to Futaba Denshi Kogyo K.K. Process for positioning and aligning dies. 4,555,840, Cl. 29-465.000.

Nakamura, Koichi: *See*—
Sato, Kozo; Fujita, Shinsaku; Nakamura, Koichi; and Naito, Hideki, 4,556,632, Cl. 430-562.000.

Nakamura, Kotaro: *See*—
Furutachi, Nobuo; Nakamura, Kotaro; and Hirose, Takeshi, 4,556,630, Cl. 430-372.000.

Nakamura, Mitsuo: *See*—
Oishibashi, Hirotsugu; Ueyama, Katsuyoshi; Ohara, Muneyuki; Nakamura, Mitsuo; Aichi, Takeo; and Sasaki, Shigeru, 4,556,164, Cl. 228-199.000.

Nakamura, Takeaki: *See*—
Shishido, Yoshio; Nishigaki, Shinichi; Kato, Shinichi; Matsuo, Kazumasa; Miyazaki, Atsushi; Takahashi, Susumu; Nakamura, Takeaki; and Ishikawa, Akibumi, 4,556,787, Cl. 250-201.000.

Nakamura, Teruya: *See*—
Umezawa, Hamao; Takeuchi, Tomio; Nishizawa, Rinzo; Takahashi, Katsutoshi; Nakamura, Teruya; and Umeda, Yoshihisa, 4,556,735, Cl. 564-157.000.

Nakamura, Toshiaki: *See*—
Watanabe, Kiyohiko; Hattori, Yoshiyuki; Nakamura, Toshiaki; and Ohnishi, Shunsaku, 4,556,363, Cl. 415-53.00T.

Nakamura, Toshinobu, to Shinagawa Shoko Co., Ltd. Fastener for electric wires around a printed circuit board. 4,556,181, Cl. 248-74.100.

Nakasugi, Mikio: *See*—
Sugiura, Yoji; Yamamoto, Hironori; Nishida, Keijiro; Shirai, Naoki; Takahashi, Kimio; Nakasugi, Mikio; and Saito, Norihisa, 4,556,285, Cl. 350-600.000.

Nakata, Nori; and Melanson, Joseph. Fish bait tier. 4,555,893, Cl. 53-390.000.

Nakaya, Hisashi: *See*—
Masuda, Shunji; Nakaya, Hisashi; and Okazaki, Katumi, 4,556,026, Cl. 123-198.00F.

Nakazato, Seiichi: *See*—
Tsurumaru, Michiko; Nakazato, Seiichi; Nunokawa, Atsushi; Ueno, Hiroshi; and Kobayashi, Seishichi, 4,556,354, Cl. 413-15.000.

Nakazawa, Hitoshi: *See*—
Tamura, Shohei; Sasaki, Sadamitsu; Sasaki, Takeshi; Ichinose, Hisashi; Nakamoto, Keiji; Abe, Masao; and Nakazawa, Hitoshi, 4,556,623, Cl. 430-83.000.

Naruse, Kazuo; Yokoi, Koji; and Kurokawa, Yoshiaki, to Trinity Industrial Corporation; and Toyota Motor Corporation. Heat welding apparatus. 4,556,783, Cl. 219-388.000.

National Mine Service Company: *See*—
Shoemaker, Leon H., 4,556,200, Cl. 254-424.000.

Nawa, Motoyuki: *See*—
Sugawara, Norio; Nawa, Motoyuki; and Takahashi, Yutaka, 4,556,172, Cl. 239-590.500.

NEC Corporation: *See*—
Ohata, Keiichi, 4,556,895, Cl. 357-23.700.
Shoji, Masashi, 4,556,805, Cl. 307-359.000.

Neeff, Rutger: *See*—
Weitz, Robert; Neeff, Rutger; and Hugl, Herbert, 4,556,401, Cl. 8-641.000.

Neki, Shigeo; Shinozaki, Nozomu; and Morofuji, Takeshi, to Matsushita Electric Industrial Co., Ltd. Sewing machine controlling apparatus. 4,556,001, Cl. 112-277.000.

Neles Inc.: *See*—
Kindersley, Peter G.; and Pyysalo, Matti O., 4,556,197, Cl. 251-315.000.

Nelson, Bertel S., to Wedgtrac Corporation. Torque limit drive transmission. 4,555,963, Cl. 74-798.000.

Nelson, Norvell J., to PSI Star. Nickel etching process and solution. 4,556,449, Cl. 156-659.100.

Nemack, Christian: *See*—
Meuer, Johannes; Nemack, Christian; and Todtenhaupt, Dieter, 4,556,766, Cl. 200-81.90R.

Nepon Co. Ltd.: *See*—
Kuwa, Masatoshi; Kamanaka, Ryusuke; and Nihei, Toshio, 4,556,103, Cl. 165-122.000.

Nespor, John F.: *See*—
Bloom, Terry R.; and Nespor, John F., 4,556,598, Cl. 428-209.000.

Neumann, Peter; Etzbach, Karl-Heinz; and Hoffmann, Gerhard, to BASF Aktiengesellschaft. Electrophotographic recording material whose photoconductor layer contains a halogenated perylene dye sensitizer. 4,556,622, Cl. 430-58.000.

Neumann, Peter: *See*—
Hoffmann, Gerhard; and Neumann, Peter, 4,556,621, Cl. 430-49.000.

Neumann, Wolfgang; Hendriock, Hans-Jurgen; and Fitz, Herbert, to Hoechst Aktiengesellschaft. Composite material of plasticized polyvinyl chloride coated with acrylic resin-fluorine-containing copolymer top coat. 4,556,589, Cl. 428-35.000.

Newman, Robert J.: *See*—
Mauleon, Jean-Louis; Newman, Robert J.; and Black, Alan J., 4,556,479, Cl. 208-164.000.

Nghiem, Xuan L.: *See*—
Bochinski, Rolf; Eimer, Klaus; Lange, Alois; and Nghiem, Xuan L., 4,556,102, Cl. 165-95.000.
NGK Insulators, Ltd.: *See*—
Mochida, Shigeru; Kojima, Masaru; and Kitagawa, Jun, 4,556,543, Cl. 422-171.000.
NGK Spark Plug Co., Ltd.: *See*—
Ito, Toshiharu; Ozeki, Eiji; and Okada, Kozo, 4,556,814, Cl. 310-334.000.
Nicholson, Michael P.: *See*—
Miller, Richard F.; and Nicholson, Michael P., 4,556,476, Cl. 208-48.0AA.
Nieh, Edward C. Y.: *See*—
Sanderson, John R.; Nieh, Edward C. Y.; and Watts, Lewis W., Jr., 4,556,730, Cl. 560-256.000.
Nihei, Toshio: *See*—
Kuwa, Masatoshi; Kamanaka, Ryusuke; and Nihei, Toshio, 4,556,103, Cl. 165-122.000.
Nihon Sanmo Dyeing Co., Ltd.: *See*—
Tomibe, Shinji; Gomibuchi, Reizo; and Takahashi, Kiyofumi, 4,556,507, Cl. 252-518.000.
Tomibe, Shinji; and Murasaki, Norio, 4,556,508, Cl. 252-518.000.
Nihon Tokushu Noyaku Seizo K.K.: *See*—
Saito, Junichi; Kudamatsu, Akio; Kume, Toyohiko; and Tsuboi, Shinichi, 4,556,650, Cl. 514-128.000.
Niida, Taro: *See*—
Shibahara, Seiji; Okonogi, Tsuneo; Murai, Yasushi; Fukatsu, Shunzo; Niida, Taro; and Wakazawa, Tadashi, 4,556,513, Cl. 260-239.00A.
Niinuma, Teruhisa: *See*—
Ohbayashi, Nobuo; Kawata, Akiho; Miya, Shuichi; and Niinuma, Teruhisa, 4,556,604, Cl. 428-323.000.
Nikomarov, Samuil S.: *See*—
Baldenko, Dmitry F.; Vadetsky, Jury V.; Goldobin, Vladimir B.; Gusman, Moisei T.; Kochnev, Anatoly M.; Nikomarov, Samuil S.; and Semenets, Valery I., 4,556,398, Cl. 464-16.000.
Nimberger, Spencer M., to General Screw Products Company. Method and apparatus for sealing valve stems. 4,556,196, Cl. 251-214.000.
Nippon Carbide Kogyo Kabushiki Kaisha: *See*—
Ochi, Katsura, 4,556,595, Cl. 428-143.000.
Nippon Electric Co., Ltd.: *See*—
Yorikane, Masaharu; and Ohseki, Noboru, 4,556,897, Cl. 357-71.000.
Nippon Gakki Seizo Kabushiki Kaisha: *See*—
Izuta, Tadao, 4,556,042, Cl. 124-89.000.
Nippon Kinzoku Co., Ltd.: *See*—
Sano, Yasumasa; and Ohwada, Tetsuya, 4,555,832, Cl. 24-682.000.
Nippon Kokan Kabushiki Kaisha: *See*—
Kondo, Tatsuo; Tamura, Manabu; Tanimura, Masayuki; and Kamemura, Yoshiki, 4,556,423, Cl. 75-125.000.
Yamada, Takemi; Satoh, Tamataro; Mizushina, Masaaki; Toyota, Koji; and Okamoto, Hiromi, 4,556,022, Cl. 123-188.0AA.
Nippon Paint Co., Ltd.: *See*—
Hirasawa, Yoji; and Ikeda, Shoji, 4,556,683, Cl. 523-447.000.
Sakurai, Kiyomi; and Arimatsu, Seiji, 4,556,462, Cl. 204-6.000.
Nippon Piston Ring Co., Ltd.: *See*—
Umeha, Genkichi; Urano, Shigeru; and Kato, Satoru, 4,556,532, Cl. 419-5.000.
Nippon Soken, Inc.: *See*—
Atsumi, Morihiro; Yoshida, Hitoshi; Ito, Nobuei; and Atsumi, Kinya, 4,556,780, Cl. 219-270.000.
Fukami, Akira; and Noguchi, Hiroki, 4,556,171, Cl. 237-12.30B.
Kuwakado, Satosi; Shimogawa, Toshiaki; Koide, Teruhiko; Kanada, Shigeyasu; and Iwatsuki, Masahiro, 4,556,177, Cl. 242-107.40A.
Sato, Susumu; Hattori, Tadashi; Ueno, Yoshiki; and Taguchi, Takashi, 4,556,599, Cl. 428-216.000.
Nippon Steel Corporation: *See*—
Yamamoto, Toshiki; Kiriu, Yukio; Tsuneoka, Akira; and Sudo, Kunikane, 4,556,099, Cl. 164-451.000.
Nippon Telegraph & Telephone Public Corp.: *See*—
Ohta, Hisao, Baji, Toru; Izawa, Yuji; Ebisui, Eizou; Tsukada, Toshihisa; and Yamamoto, Hideaki, 4,556,800, Cl. 250-578.000.
Nippon Thompson Co, Ltd.: *See*—
Geka, Toshiaki, 4,556,262, Cl. 308-6.00C.
Nippon Zeon Co., Ltd.: *See*—
Ogura, Shunichiro; and Soumai, Masamichi, 4,556,461, Cl. 203-29.000.
Nippondenso Co., Ltd.: *See*—
Atsumi, Morihiro; Yoshida, Hitoshi; Ito, Nobuei; and Atsumi, Kinya, 4,556,780, Cl. 219-270.000.
Watanabe, Kiyohiko; Hattori, Yoshiyuki; Nakamura, Toshiaki; and Ohnishi, Shunsaku, 4,556,363, Cl. 415-53.00T.
Nishida, Keijiro: *See*—
Sugiura, Yoji; Yamamoto, Hironori; Nishida, Keijiro; Shirai, Naoki; Takahashi, Kimio; Nakasugi, Mikio; and Saito, Norihisa, 4,556,285, Cl. 350-600.000.
Nishigaki, Haruo; Watanabe, Koji; Fukui, Shiroh; and Kanematsu, Kiyoshi, to Asahi Glass Co., Ltd.; and Mitsubishi Denki Kabushiki Kaisha. Flame resistant oil. 4,556,511, Cl. 252-573.000.
Nishigaki, Shinichi: *See*—
Shishido, Yoshio; Nishigaki, Shinichi; Kato, Shinichi; Matsuo, Kazumasa; Miyazaki, Atsushi; Takahashi, Susumu; Nakamura, Takeaki; and Ishikawa, Akibumi, 4,556,787, Cl. 250-201.000.
Nishikawa, Hideo; Okamoto, Kenzo; Sakai, Koichi; and Kitada, Fumihiko, to Imanishi Kinzoku Kogyo Kabushi Kaisha. Reflection type kerosene stove. 4,556,045, Cl. 126-96.000.
Nishimu Electronics Industries, Co., Ltd.: *See*—
Harada, Kosuke; Murata, Katsuaki; and Nakamizo, Takazi, 4,556,802, Cl. 307-66.000.
Nishimura, Ryuji: *See*—
Imaide, Takuya; Masuda, Michio; Okuda, Akihide; and Nishimura, Ryuji, 4,556,911, Cl. 358-212.000.
Nishino, Hiroshi; Aibe, Toshio; and Noguchi, Katsuya, to Takeda Chemical Industries, Ltd. Process for treatment of gases. 4,556,547, Cl. 423-230.000.
Nishio, Kazuo; Chiyomaru, Isao; Anma, Katsuo; Yamamoto, Kazuko; Ohno, Hiroshi; and Takayanagi, Noriyasu, to Kumiai Kagaku Kogyo Kabushiki Kaisha; and Toyo Jozo Kabushiki Kaisha. 2,-3-Di-substituted-5,6-dihydroimidazo [2,1-b] thiazole, its salts, production thereof and anti-inflammatory agent containing the same. 4,556,669, Cl. 514-368.000.
Nishiumi, Kenji: *See*—
Akagawa, Masaki; Onda, Hideaki; Kobayashi, Osamu; and Nishiumi, Kenji, 4,556,139, Cl. 194-4.00C.
Nishiwaki, Tsutomu: *See*—
Matsushita, Yoshikazu; Takei, Masaki; Yonekubo, Masatoshi; and Nishiwaki, Tsutomu, 4,556,891, Cl. 346-76.0PH.
Nishizawa, Rinzo: *See*—
Umezawa, Hamao; Takeuchi, Tomio; Nishizawa, Rinzo; Takahashi, Katsutoshi; Nakamura, Teruya; and Umeda, Yoshihisa, 4,556,735, Cl. 564-157.000.
Nissan Motor Co., Ltd.: *See*—
Aono, Shigeo, 4,556,030, Cl. 123-425.000.
Oaku, Takaaki; Shioda, Masahiko; Suzuki, Syunsuke; and Maki, Yoshihiro, 4,556,533, Cl. 419-11.000.
Sugano, Kazuhiko, 4,555,964, Cl. 74-869.000.
Tanaka, Shigenori; and Tomia, Kouji, 4,556,088, Cl. 139-452.000.
Yamaguchi, Hiroshi; Sawamoto, Kunifumi; Sanbuichi, Hiroshi; Morita, Tatsuo; and Takizawa, Satoshi, 4,556,029, Cl. 123-41.150.
Nitsuko Limited: *See*—
Inaba, Hiroshi, 4,556,769, Cl. 200-340.000.
Nitto Electric Industrial Co., Ltd.: *See*—
Tamura, Shohei; Sasaki, Sadamitsu; Sasaki, Takeshi; Ichinose, Hisashi; Nakamoto, Keiji; Abe, Masao; and Nakazawa, Hitoshi, 4,556,623, Cl. 430-83.000.
Nitto Kabushiki Kaisha: *See*—
Ohta, Tsuyoshi; and Uritani, Koji, 4,555,943, Cl. 73-457.000.
Niva, Karl-Erik, to Kiruna Truck, AB. U-Frame truck. 4,556,356, Cl. 414-458.000.
Nogi, Hiroyoshi; and Tanaka, Shigeru, to Musashi Engineering Kabushiki Kaisha. Stacker for paper sheet counting apparatus. 4,556,212, Cl. 271-315.000.
Noguchi, Hiroki: *See*—
Fukami, Akira; and Noguchi, Hiroki, 4,556,171, Cl. 237-12.30B.
Noguchi, Katsuya: *See*—
Nishino, Hiroshi; Aibe, Toshio; and Noguchi, Katsuya, 4,556,547, Cl. 423-230.000.
Norbert, John: *See*—
Voigt, Karl; Kamm, Jurgen; and Norbert, John, 4,555,994, Cl. 110-261.000.
North American Philips Consumer Electronics Corporation: *See*—
Speigel, Kenneth, 4,556,626, Cl. 430-274.000.
North Carolina State University: *See*—
Esbenshade, Kenneth L., 4,556,555, Cl. 424-85.000.
Northern Telecom Limited: *See*—
Dragunevicius, Algirdas J.; Kuhfus, Gerd; and Walker, Charles R. S., 4,556,763, Cl. 179-164.000.
Znojkiewicz, Maciej E., 4,556,852, Cl. 331-96.000.
Noschese, Rocco J., to Burndy Corporation. Circuit board connector system having independent contact segments. 4,556,268, Cl. 339-74.00R.
Novotny, Joseph, to Allied Corporation. Method and composition for corrosion inhibition of carbon steel by ammonium sulfate. 4,556,536, Cl. 422-7.000.
NSK-Warner K.K.: *See*—
Kawai, Osamu, 4,556,255, Cl. 297-483.000.
Sano, Yasumasa; and Ohwada, Tetsuya, 4,555,832, Cl. 24-682.000.
Numata, Kiyoshi; Yoshida, Toshihiro; and Kokubo, Takashi, to Sony Corporation. Automatic viewing screen. 4,556,283, Cl. 350-117.000.
Nunokawa, Atsushi: *See*—
Tsurumaru, Michiko; Nakazato, Seiichi; Nunokawa, Atsushi; Ueno, Hiroshi; and Kobayashi, Seishichi, 4,556,354, Cl. 413-15.000.
Nyfeler, Alex; Gehr, Peter; Stalder, Martin; and Antes, Gregor, to LGZ Landis & Gyr Zug AG. Apparatus for embossing high resolution relief patterns. 4,556,378, Cl. 425-143.000.
Oaku, Takaaki; Shioda, Masahiko; Suzuki, Syunsuke; and Maki, Yoshihiro, to Nissan Motor Co., Ltd. Wear-resistant sintered ferrous alloy and method of producing same. 4,556,533, Cl. 419-11.000.
Oberbach, Josef, to Michael Geiseler DBF-Vertriebs-GmbH. Protective cover against radiation. 4,556,757, Cl. 174-35.00R.
Ochi, Katsura, to Nippon Carbide Kogyo Kabushiki Kaisha. Pressure-sensitive adhesive sheet structure having relocatable properties. 4,556,595, Cl. 428-143.000.
Offen, George R.: *See*—
Torbov, Tsvetan I.; Offen, George R.; and Denike, Stuart K., 4,555,996, Cl. 110-345.000.
Ogata, Naoya; Sanui, Kohei; Azuma, Chiaki; Tanaka, Hozumi; Oguchi, Kiyoshi; Takahashi, Yoichi; and Nakada, Tomihiro, to Dai Nippon

Insatsu Kabushiki Kaisha. Negative-type acetalized polyvinyl alcohol resist sensitive to ionizing radiation. 4,556,619, Cl. 430-17.000.

Ogawa, Hirofumi: *See*—
Kusano, Chushirou; Ishioka, Sachio; Imamura, Yoshinori; Takasaki, Yukio; Ogawa, Hirofumi; Makishima, Tatsuo; Hirai, Tadaaki; and Maruyama, Eiichi, 4,556,817, Cl. 313-371.000.

Ogawa, Yonekichi, to Suisaku Kabushiki Kaisha. Filter. 4,556,485, Cl. 210-169.000.

Oguchi, Kiyoshi: *See*—
Ogata, Naoya; Sanui, Kohei; Azuma, Chiaki; Tanaka, Hozumi; Oguchi, Kiyoshi; Takahashi, Yoichi; and Nakada, Tomihiro, 4,556,619, Cl. 430-17.000.

Oguma, Tomio: *See*—
Okamoto, Toshiaki; Oguma, Tomio; and Kaga, Matasaburo, 4,556,038, Cl. 123-564.000.

Ogura, Shinji: *See*—
Horie, Motonobu; Suzuki, Minoru; and Ogura, Shinji, 4,556,072, Cl. 131-282.000.

Ogura, Shunichiro; and Soumai, Masamichi, to Nippon Zeon Co., Ltd. Process for separating highly pure butene-1 or butene-1/isobutene mixture from C_4 hydrocarbon fraction. 4,556,461, Cl. 203-29.000.

Ohara, Muneyuki: *See*—
Oishibashi, Hirotsugu; Ueyama, Katsuyoshi; Ohara, Muneyuki; Nakamura, Mitsuo; Aichi, Takeo; and Sasaki, Shigeru, 4,556,164, Cl. 228-199.000.

Ohata, Keiichi, to NEC Corporation. Field-effect transistor having a channel region of a Group III-V compound semiconductor and a Group IV semiconductor. 4,556,895, Cl. 357-23.700.

Ohbayashi, Nobuo; Kawata, Akiho; Miya, Shuichi; and Niinuma, Teruhisa, to Kanto Denka Kogyo Co., Ltd. Magnetic recording media. 4,556,604, Cl. 428-323.000.

Ohhashi, Mosaburo; and Yanai, Hiroshi. Piezoelectric device for detecting stoppage of a nozzle. 4,556,815, Cl. 310-338.000.

Ohnishi, Shunsaku: *See*—
Watanabe, Kiyohiko; Hattori, Yoshiyuki; Nakamura, Toshiaki; and Ohnishi, Shunsaku, 4,556,363, Cl. 415-53.00T.

Ohno, Hiroshi: *See*—
Nishio, Kazuo; Chiyomaru, Isao; Anma, Katsuo; Yamamoto, Kazuko; Ohno, Hiroshi; and Takayanagi, Noriyasu, 4,556,669, Cl. 514-368.000.

Ohno, Shigeru: *See*—
Motoyama, Shimesu; Kurita, Kaora; Sakashita, Shizuka; Takei, Narimichi; and Ohno, Shigeru, 4,556,175, Cl. 241-57.000.

Ohno, Takaaki: *See*—
Saito, Taro; Umeki, Kazumi; Ohno, Takaaki; Sakane, Hirobumi; Tsujino, Masahide; Sanpei, Keiichi; Nagamine, Yoshibumi; and Sato, Yoshitaka, 4,556,113, Cl. 172-91.000.

Ohseki, Noboru: *See*—
Yorikane, Masaharu; and Ohseki, Noboru, 4,556,897, Cl. 357-71.000.

Ohta, Hisao; Baji, Toru; Izawa, Yuji; Ebisui, Eizou; Tsukada, Toshihisa; and Yamamoto, Hideaki, to Nippon Telegraph & Telephone Public Corp.; and Hitachi, Ltd. Optical image sensor apparatus with grouped photosensors connected in common. 4,556,800, Cl. 250-578.000.

Ohta, Kosei: *See*—
Takazoe, Ichiro; Ohta, Kosei; Shimizu, Junichi; Suzuki, Kazumasa; Iwakura, Tatsuya; and Nakajima, Yoshikazu, 4,556,429, Cl. 127-30.000.

Ohta, Norio: *See*—
Imura, Ryo; Ikeda, Tadashi; Takeuchi, Teruaki; Ohta, Norio; and Sugita, Yutaka, 4,556,583, Cl. 427-38.000.

Ohta, Tsuyoshi; and Uritani, Koji, to Riken Keiki Kabushiki Kaisha; and Nitto Kabushiki Kaisha. Method of and apparatus for measuring an unbalance value of a wheel mounted on a body of an automobile. 4,555,943, Cl. 73-457.000.

Ohtake, Matsuo, to Fuji Seiki Machine Works, Ltd. Process and apparatus for finishing electronic device. 4,555,876, Cl. 51-418.000.

Ohura, Masaki: *See*—
Suenaga, Masahide; Chida, Kousaku; and Ohura, Masaki, 4,556,925, Cl. 360-113.000.

Ohwada, Tetsuya: *See*—
Sano, Yasumasa; and Ohwada, Tetsuya, 4,555,832, Cl. 24-682.000.

Oide, Kunimasa, to Daichiku Co., Ltd. Stapler and staples to be mounted. 4,556,161, Cl. 227-83.000.

Oishibashi, Hirotsugu; Ueyama, Katsuyoshi; Ohara, Muneyuki; Nakamura, Mitsuo; Aichi, Takeo; and Sasaki, Shigeru, to Japanese National Railways; Hakusan Seisakusho Co., Ltd.; and Kyushu Tetsudo Kiki Seizo Co., Ltd. Method of field welding head-hardened rails. 4,556,164, Cl. 228-199.000.

Okada, Kazuo, to Kabushiki Kaisha Universal. Method and apparatus for discriminating coins or bank notes. 4,556,140, Cl. 194-4.00C.

Okada, Kodo: *See*—
Irikura, Tsutomu; Suzue, Seigo; and Okada, Kodo, 4,556,715, Cl. 546-322.000.

Okada, Kozo: *See*—
Ito, Toshiharu; Ozeki, Eiji; and Okada, Kozo, 4,556,814, Cl. 310-334.000.

Okamori, Kenji: *See*—
Yamazaki, Taro; Okamoto, Masashi; Iizuka, Tokio; Tsukada, Norishige; and Okamori, Kenji, 4,556,918, Cl. 358-283.000.

Okamoto, Hiromi: *See*—
Yamada, Takemi; Satoh, Tamataro; Mizushina, Masaaki; Toyota, Koji; and Okamoto, Hiromi, 4,556,022, Cl. 123-188.0AA.

Okamoto, Kenzo: *See*—
Nishikawa, Hideo; Okamoto, Kenzo; Sakai, Koichi; and Kitada, Fumihiko, 4,556,045, Cl. 126-96.000.

Okamoto, Masashi: *See*—
Yamazaki, Taro; Okamoto, Masashi; Iizuka, Tokio; Tsukada, Norishige; and Okamori, Kenji, 4,556,918, Cl. 358-283.000.

Okamoto, Toshiaki; Oguma, Tomio; and Kaga, Matasaburo, to Aisin Seiki Kabushiki Kaisha. Supercharged internal combustion engine having control means responsive to engine speed and accelerator pedal velocity. 4,556,038, Cl. 123-564.000.

Okamura, Kiyohito: *See*—
Yajima, Seishi; Okamura, Kiyohito; Hasegawa, Yoshio; and Yamamura, Takemi, 4,556,526, Cl. 264-60.000.

Okazaki, Katumi: *See*—
Masuda, Shunji; Nakaya, Hisashi; and Okazaki, Katumi, 4,556,026, Cl. 123-198.00F.

Okazaki, Masaki: *See*—
Tanemura, Hatsumi; Ukai, Toshinao; Okazaki, Masaki; Deguchi, Naoyasu; Fujita, Munehisa; and Yamamuro, Kiyohiko, 4,556,633, Cl. 430-573.000.

Okonogi, Tsuneo: *See*—
Shibahara, Seiji; Okonogi, Tsuneo; Murai, Yasushi; Fukatsu, Shunzo; Niida, Taro; and Wakazawa, Tadashi, 4,556,513, Cl. 260-239.00A.

"Oktober 6" Mezogazdasagi Termeloszovetkezet: *See*—
Hegedus, Bela; Balint, Sandor; Hudak, Janos; Barta, Gyorgy; and Aszlanyi, Jozsef, 4,555,858, Cl. 34-25.000.

Okuda, Akihide: *See*—
Imaide, Takuya; Masuda, Michio; Okuda, Akihide; and Nishimura, Ryuji, 4,556,911, Cl. 358-212.000.

Okudaira, Sadao, to Asahi Kogaku Kogyo Kabushiki Kaisha. Ultracompact telephoto lens. 4,556,295, Cl. 350-454.000.

Okumura, Hiroshi: *See*—
Tazima, Yoshihisa; Morishima, Masayuki; Okumura, Hiroshi; and Kasahara, Shin-ichi, 4,556,770, Cl. 219-10.49R.

Olderdissen, Ulrich; and Schumacher, Hans, to International Business Machines Corporation. Decoding of BCH double error correction - triple error detection (DEC-TED) codes. 4,556,977, Cl. 371-37.000.

Olin Corporation: *See*—
Meatto, Franklin D.; and Pilpel, Edward D., 4,556,237, Cl. 280-610.000.

Olivera, Raul, to Motorola, Inc. Fuse and mounting arrangement for printed circuit board application. 4,556,274, Cl. 339-147.00R.

Olmsted, Dennis R., to Data Electronics, Inc. Tape cartridge drive with cartridge door opening mechanism. 4,556,923, Cl. 360-93.000.

Olson, Daniel R., to General Electric Company. UV-Stabilized coated polyester-carbonate articles and process. 4,556,606, Cl. 428-412.000.

Olympus Optical Co., Ltd.: *See*—
Fujibayashi, Kenji, 4,556,919, Cl. 360-74.100.
Ida, Masatoshi, 4,556,908, Cl. 358-212.000.
Izawa, Masao; and Tatsukawa, Sachiko, 4,556,639, Cl. 435-284.000.
Kano, Tokio; and Tamagawa, Akira, 4,556,641, Cl. 436-165.000.
Shishido, Yoshio; Nishigaki, Shinichi; Kato, Shinichi; Matsuo, Kazumasa; Miyazaki, Atsushi; Takahashi, Susumu; Nakamura, Takeaki; and Ishikawa, Akibumi, 4,556,787, Cl. 250-201.000.
Yamada, Hidetoshi, 4,556,909, Cl. 358-212.000.

Omron Tateisi Electronics Co.: *See*—
Atsumi, Haruo; Iwakiri, Norio; Kiyono, Yasuhiro; and Hayakawa, Tomohiko, 4,556,768, Cl. 200-302.200.

Onda, Hideaki: *See*—
Akagawa, Masaki; Onda, Hideaki; Kobayashi, Osamu; and Nishiumi, Kenji, 4,556,139, Cl. 194-4.00C.

O'Neil, Walter K., to Eaton Corporation. Fail-safe mechanism for an electrical power assisted steering system. 4,556,116, Cl. 180-79.100.

Ootsuga, Hisao: *See*—
Kamuro, Takashi; Ootsuga, Hisao; Saito, Isao; and Koga, Motoyuki, 4,556,580, Cl. 427-8.000.

Ooue, Michio: *See*—
Kurihara, Yasutoshi; Suzuki, Yoshihiro; Ooue, Michio; Hachino, Hiroaki; and Yanagi, Mitsuo, 4,556,899, Cl. 357-80.000.

Optische Werke G. Rodenstock: *See*—
Dietrich, Anton, 4,556,300, Cl. 351-137.000.

Orpet, Edward G. Radiation pyrometer system. 4,556,328, Cl. 374-144.000.

Ortho Pharmaceutical Corporation: *See*—
Kanojia, Ramesh M.; Bandurco, Victor T.; Levine, Seymour D.; Mulvey, Dennis M.; and Tobia, Alfonso J., 4,556,739, Cl. 564-443.000.

Osaka Gas Company, Limited: *See*—
Miyamoto, Hirofumi; Kaitatsu, Nobuaki; Sugitani, Junichi; Taniguchi, Yasumaru; and Kaji, Tetsuo, 4,555,948, Cl. 73-640.000.

Osawa, Hide: *See*—
Arima, Tetsuo; Kawamoto, Akio; and Osawa, Hide, 4,556,565, Cl. 426-3.000.

Osborn, Denis L., to U.S. Industries, Inc. Feed proportioner. 4,556,015, Cl. 119-56.00R.

Osegowitsch, Viktor, to AGFA-Gevaert A.G. Arrangement for and method of regenerating processing baths for photosensitive materials. 4,556,305, Cl. 354-298.000.

Osterholt, Gerd: *See*—
Weber, Heinrich; Lorenz, Kurt; Dungs, Horst; Bruns, Engelbert; and Osterholt, Gerd, 4,556,455, Cl. 201-39.000.

O'Sullivan, Daniel J. Extendible ceiling hook. 4,556,184, Cl. 248-330.100.

Otis Elevator Company: *See*—
Koppensteiner, Werner, 4,556,155, Cl. 187-38.000.

Otsuka, Ryotatsu; Tanimoto, Sigemi; and Toyoda, Kazuo, to Showa Aluminum Corporation. Process for treating molten aluminum to remove hydrogen gas and non-metallic inclusions therefrom. 4,556,419, Cl. 75-68.00R.

Otto, Dennis L.: *See*—
Drygalski, Gordon T.; Otto, Dennis L.; and Ross, Donald K., 4,556,225, Cl. 277-152.000.

Otzen, Uwe; and Wild, Karl. Catch for safety belts of air, water, and land transport means. 4,555,831, Cl. 24-603.000.

Owens-Corning Fiberglas Corporation: *See*—
Miller, Gary M., 4,556,176, Cl. 242-38.000.
Tobias, Russell H.; and Hutchings, David A., 4,556,860, Cl. 338-22.0SD.

Ozawa, Lyuji, to Matsushita Electric Industrial Co., Ltd. Insulating crystals for coating on a metal mesh of a storage tube. 4,556,818, Cl. 313-395.000.

Ozeki, Eiji: *See*—
Ito, Toshiharu; Ozeki, Eiji; and Okada, Kozo, 4,556,814, Cl. 310-334.000.

Paau, Alan; Platt, Steven G.; and Sequeira, Luis, to Agracetus. Assay method and probe for polynucleotide sequences. 4,556,643, Cl. 436-501.000.

Packing Materials Corporation: *See*—
Fox, James D.; Beckway, Bruce C.; and DeGroot, Robert H., 4,556,167, Cl. 229-45.00R.

Pacquet, Denis. Machine for preparing culinary specialties in the form of flat cakes. 4,555,985, Cl. 99-353.000.

Page, Elwin H. Sofa-bunk bed combination. 4,555,821, Cl. 5-9.00R.

Pailler, Alain L. N., to Electronique Serge Dassault. Unitary guide for platen and print head. 4,556,334, Cl. 400-124.000.

Palacio, Joaquin J.: *See*—
Rionda, Carlos S.; and Palacio, Joaquin J., 4,555,887, Cl. 52-712.000.

Palfery, Kenneth J.; Malcolm, John S.; and Maharaj, Kenrick B., to McDonnell Douglas Corporation. Part turnover attachment for automatic machine tool. 4,555,844, Cl. 29-568.000.

Palmaer, Leif: *See*—
Palmaer, Tore; Palmaer, Leif; and Jacobsson, Bjorn, 4,556,121, Cl. 181-129.000.

Palmaer, Tore; Palmaer, Leif; and Jacobsson, Bjorn, to Palmaer, Tore; and Palmaer, Leif. Holder. 4,556,121, Cl. 181-129.000.

Palmer, David: *See*—
Blechschmid, John; Coyne, Richard D.; Palmer, David; and Piatt, John A., 4,556,785, Cl. 219-460.000.

Panasewich, Raymond. Tackle box. 4,555,862, Cl. 43-54.100.

Pankoke, Werner, to Theodor Hymmen KG, Firma. Device for applying surface pressure to advancing workpieces. 4,555,988, Cl. 100-154.000.

Papst-Motoren GmbH & Co. K.G.: *See*—
von der Heide, Johann, 4,556,829, Cl. 318-254.000.

Parini, Ettore: *See*—
Giani, Roberto; Parini, Ettore; and Tonon, Giancarlo, 4,556,653, Cl. 514-220.000.

Parker, Norman W.: *See*—
Ward, James W.; Schlanger, Herbert; McNulty, Hugh, Jr.; and Parker, Norman W., 4,556,794, Cl. 250-309.000.

Parker, Tony E.; and Veneski, Gerard A., to International Business Machines Corp. Microcode control mechanism utilizing programmable microcode repeat counter. 4,556,938, Cl. 364-200.000.

Parlman, Robert M.: *See*—
Bresson, Clarence R.; and Parlman, Robert M., 4,556,500, Cl. 252-61.000.

Parsons Controls Limited: *See*—
Millington, Michael J., 4,556,246, Cl. 294-82.110.

Patzelt, Helmut: *See*—
Scholz, Hans J.; and Patzelt, Helmut, 4,556,236, Cl. 280-729.000.

Paulseth, Stephen G. Ankle orthosis. 4,556,054, Cl. 128-80.00H.

Pausch, Josef; and Sorenson, David A., to General Resource Corp. Bin fluidizer. 4,556,173, Cl. 239-533.130.

Pauwels, Michael A.; Wright, Danny O.; and Harvey, Bruce J., to Allied Corporation. Multiprocessing microprocessor based engine control system for an internal combustion engine. 4,556,943, Cl. 364-431.120.

Pauwels, Michael A.: *See*—
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Bialy, Jan; Penczek, Irena; Maczenski, Stanislaw; and Borensztajn, Marek, 4,556,699, Cl. 526-68.000.

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Hansen, David M., 4,555,928, Cl. 72-451.000.

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Perkin-Elmer Corporation, The: *See*—
Schmid, Carl E., 4,556,367, Cl. 417-18.000.
Scott, Raymond P. W., 4,555,936, Cl. 73-61.10C.

Perlin, Alfred R., to Metatech Corporation. Surgical clip. 4,556,060, Cl. 128-325.000.

Persson, Bert; and Svensson, Hakan. Method of controlling noxious insects. 4,556,010, Cl. 116-22.00R.

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Peterson, Gordon C.: *See*—
Blackmore, Eunice S.; Peterson, Gordon C.; and Tiddy, Gordon J. T., 4,556,502, Cl. 252-8.800.

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Peyton, Richard H., to Allied Corporation. Switching valve for a fuel supply system. 4,556,077, Cl. 137-112.000.

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Martin, August, 4,555,998, Cl. 112-121.120.

Pfeiffer, John W., to Koppers Company, Inc. Rotary vane valve including means for ensuring uniform distribution of purge gas. 4,556,079, Cl. 137-240.000.

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Kadin, Saul B., 4,556,672, Cl. 514-414.000.
Lipinski, Christopher A., 4,556,670, Cl. 514-390.000.
Welch, Willard M., Jr.; Harbert, Charles A.; Koe, B. Kenneth; and Kraska, Allen R., 4,556,676, Cl. 514-554.000.

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Bresson, Clarence R.; and Parlman, Robert M., 4,556,500, Cl. 252-61.000.
Cawi, Vernon A.; and Stengle, Barry J., 4,556,480, Cl. 208-211.000.
Cobb, R. Lynn, 4,556,750, Cl. 585-446.000.
Hitzman, Donald O.; and Hopkins, Thomas R., 4,556,635, Cl. 435-25.000.
Shaw, James E., 4,556,495, Cl. 252-8.55D.
Thorsrud, Agmund K., 4,556,603, Cl. 428-283.000.
Wu, Yulin, 4,556,110, Cl. 166-310.000.
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Yeh, Gene H. C.; Martin, Joel L.; and Hsieh, Henry L., 4,556,647, Cl. 502-102.000.

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Pierson, Charles W., to Eastman Kodak Company. Device for determining ionic analyte activity. 4,556,474, Cl. 204-416.000.

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Andersson, Kenneth; and Pihl, Per, 4,556,574, Cl. 426-570.000.

Pilarczyk, Karol, to Vevy Manufacturing Inc. Heat recovery system. 4,555,902, Cl. 60-39.500.

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Pilpel, Edward D.: *See*—
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Pitkanen, Alan R. Computer directed exercising apparatus. 4,556,216, Cl. 272-126.000.
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Daniels, Edward P.; and Dlugos, Daniel F., 4,556,944, Cl. 364-466.000.
Pittway Corporation: *See—*
Shaw, Arthur W.; and Gepner, Isadore, 4,556,765, Cl. 200-61.710.
Piwinski, John J.: *See—*
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Pizza Hut, Inc.: *See—*
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Platt, Steven G.: *See—*
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Mason, James S.; and Foerster, David, 4,555,974, Cl. 91-363.00A.
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Erlichman, Irving, 4,556,892, Cl. 346-76.0PH.
Sorli, Duncan C.; and Keightley, John H., 4,556,306, Cl. 354-304.000.
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Wiechowski, Joseph W., 4,555,886, Cl. 52-667.000.
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Post, Steven W., to FMC Corporation. Constant flow positive displacement pump. 4,556,371, Cl. 417-539.000.
Poulin, Susan B.; and Salamone, Ann B., to Morton Thiokol, Inc. Deveioper composition for positive photoresists using solution with cyclic quaternary ammonium hydroxides. 4,556,629, Cl. 430-331.000.
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PPG Industries, Inc.: *See—*
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Fecik, Michael T.; Frank, Robert G.; and Ewing, John J., 4,556,408, Cl. 65-289.000.
Kahle, Lisa M., 4,556,406, Cl. 65-106.000.
Prade, Ernstfried, to Mistral Windsurfing AG. Sailboard and a process for producing the same. 4,556,003, Cl. 114-39.000.
Preco Industries, Inc.: *See—*
Raney, Charles C.; and Gramling, James T., 4,555,968, Cl. 83-209.000.
Prescott, Leo L., Jr.; and Eddy, Bryon C. Bow string grip and release. 4,556,041, Cl. 124-35.00A.
Presser, Adolph, to RCA Corporation. Planar, lumped element, matched N-way power divider. 4,556,856, Cl. 333-124.000.
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Buckingham, Kent W., 4,556,560, Cl. 424-145.000.
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Przybysz, John X., to Westinghouse Electric Corp. Temperature stable self-protected thyristor and method of producing. 4,555,845, Cl. 29-574.000.
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Nelson, Norvell J., 4,556,449, Cl. 156-659.100.
Pudims, Albert A., to Westinghouse Electric Corp. Electrical wiring device with cord grip fingers having longitudinal flex joints. 4,556,273, Cl. 339-103.00M.
Pujari, Vimal K., to Allied Corporation. Vacuum fluidized powder feed apparatus. 4,556,090, Cl. 141-59.000.
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Mendoza, Joe, 4,556,933, Cl. 362-267.000.
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Puszakowski, Stanley. Vibration damper and method of making the same. 4,556,130, Cl. 188-218.00A.
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Quarroz, Daniel, to Lonza Ltd. Process for the production of 2-halopyridine derivatives. 4,556,716, Cl. 546-345.000.
Quirk, Jennifer M.; and Turner, Scot, to Union Carbide Corporation. Process for the preparation of aminopropylalkoxysilanes. 4,556,722, Cl. 556-413.000.
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Quist, Frederick F., Jr.; and Steinbrecher, Marc L., to International Business Machines Corporation. Disk drive head accessing mechanism. 4,556,924, Cl. 360-106.000.
Raab, Andrew F.; and Cobb, Albert R., III, to Indak Manufacturing Corp. Slide action electrical switches. 4,556,764, Cl. 200-16.00C.
Raab, Norbert: *See—*
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Raap, Teresa A.: *See—*
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Raggam, Augustin; and Rabitsch, Hermann, to Simmering-Graz-Pauker Aktiengesellschaft. Process and apparatus for producing pulp. 4,556,452, Cl. 162-233.000.
Rahn, Melanie H.; and Braun, Jane E., to Laporte, Dorothy, a part interest. Adult/child communication kit. 4,556,390, Cl. 434-433.000.
Raines, Kenneth C., to Burron Medical Inc. Dual disc low pressure back-check valve. 4,556,086, Cl. 137-852.000.
Ramisch, Jan, to BBC Brown, Boveri & Company Limited. Butterfly valve with servo-motor. 4,556,192, Cl. 251-58.000.
Raney, Charles C.; and Gramling, James T., to Preco Industries, Inc. Web fed die cutting press having automatic 3-axis die registration system. 4,555,968, Cl. 83-209.000.
Ranganathan, V. Thathachary T.: *See—*
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Rankowitz, Marshall M.: *See—*
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Raychem Corporation: *See—*
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Raymond, Ronald P.; and Andrick, William C., to Polymer/Raymond Industries, Inc. Filler strip with locking clip. 4,555,885, Cl. 52-468.000.
Raytheon Company: *See—*
Thomas, Calvin J., 4,556,771, Cl. 219-10.55F.
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Clark, Raymond N., 4,556,853, Cl. 333-26.000.
Cooper, John C., 4,556,821, Cl. 315-8.000.
Crosby, Edward L., Jr., 4,555,932, Cl. 73-24.000.
Cunningham, Thomas J., 4,556,265, Cl. 339-17.0LC.
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Hanak, Joseph J., 4,556,788, Cl. 250-203.00R.
Krufka, Frank S., 4,556,902, Cl. 358-107.000.
Levine, Peter A., 4,556,851, Cl. 329-50.000.
Monat, Robert A., 4,556,904, Cl. 358-147.000.
Presser, Adolph, 4,556,856, Cl. 333-124.000.
Thompson, Robert P., 4,556,620, Cl. 430-25.000.
Thompson, Robert P., 4,556,820, Cl. 313-470.000.
VanBreemen, Bertram; Wilson, William L.; Roberts, Duane L.; and Branton, Tom W., 4,556,913, Cl. 358-237.000.

Willis, Donald H., 4,556,900, Cl. 358-23.000.
Read, Edgar L., to Honeywell Inc. Apparatus for providing conflict-free highway access. 4,556,939, Cl. 364-200.000.
Reading, Christopher: *See*—
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Boross, Laszlo ; Szajani, Bela; and Kovacs, Kamilla, 4,556,637, Cl. 435-181.000.
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Reed, Michael F.: *See*—
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Reed Rock Bit Company: *See*—
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Reedy, James D.; and Walsh, John J., to Union Carbide Corporation. Process for converting octamethylcyclotetrasiloxane to decamethylcyclopentasiloxane. 4,556,726, Cl. 556-460.000.
Regtien, Paulus P. L., to Endress U. Hauser GmbH u. Co. Resistance thermometer and linearization circuitry. 4,556,330, Cl. 374-185.000.
Reich, Richard B., to S. Himmelstein and Company. Torquemeter apparatus. 4,555,956, Cl. 73-862.320.
Reich Spezialmaschinen GmbH: *See*—
Abt, Anton, 4,555,969, Cl. 83-471.300.
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Rek, Johannes H. M., to Lever Brothers Company. Aqueous alkaline liquid detergent composition. 4,556,504, Cl. 252-135.000.
Remy, Michel N.; Delaite, Jean-Francois; and Woirgard, Guy J., to Autocoussin. Automatic machine for curving, in a spatial configuration, thin and rectilinear metal elements, more especially metal wires. 4,555,924, Cl. 72-307.000.
Renals, Martin, to U.S. Philips Corporation. Infrared radiation detector. 4,556,796, Cl. 250-338.000.
Renger, Herman L. Method and apparatus for measuring fluid flow rates and volumes through fluid flow paths. 4,555,940, Cl. 73-204.000.
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Resnicow, Herbert, to American Snap Nut Association. Shaft-mounted snap lock assembly. 4,556,352, Cl. 411-433.000.
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Rice, Kenner C., to United States of America, Health and Human Services. Preparation and racemization of chiral 1-benzyl-1,2,3,4-tetrahydroisoquinolines. 4,556,712, Cl. 546-149.000.
Richter, Johan C. F .C.; and Richter, Ole J., to Kamyr Aktiebolag. Method of diffusion washing or thickening of pulp. 4,556,494, Cl. 210-785.000.
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Riffel, Leonard F.; and Barrera, Ricardo, to Pizza Hut, Inc. Hood for oven in pizza delivery vehicle. 4,556,046, Cl. 126-299.00D.
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Riley, James E.; and Tyson, Neil W., to Energy Systems, Inc. Removable thermal insulation jacket for valves and fittings. 4,556,082, Cl. 137-375.000.
Rinehart, Thomas A.; Willson, Richard F.; and Halling, Vaughn W., to Minnesota Mining and Manufacturing Company. Optical recording medium of high sensitivity. 4,556,893, Cl. 346-135.100.
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Beisse, Achim; Harer, Helmut; Mohr, Adolf; and Schustek, Siegfried, 4,556,809, Cl. 310-114.000.
Frech, Alfred, 4,555,850, Cl. 30-490.000.
Gloss, Erwin; Lotterbach, Gerhard; Perenthaler, Egbert; Schenk, Manfred; Van Woudenberg, Jan F.; and Zucker, Udo, 4,556,036, Cl. 123-491.000.
Heitmann, Jurgen; and Rickenbrock, Horst, 4,556,983, Cl. 375-60.000.
Heyke, Klaus, 4,556,040, Cl. 123-643.000.
Kemmner, Ulrich; and Soyer, Wolfgang, 4,556,490, Cl. 210-349.000.
Kniss, Helmut; and Locher, Johannes, 4,556,039, Cl. 123-569.000.
Leroy, Andre ; and Flamme, Jean M., 4,556,372, Cl. 418-1.000.
Sumal, Jaihind S., 4,555,937, Cl. 73-118.000.
Roberts, Duane L.: *See*—
VanBreemen, Bertram; Wilson, William L.; Roberts, Duane L.; and Branton, Tom W., 4,556,913, Cl. 358-237.000.
Roberts, Frank L., to Bio-Support Industries Limited. Backrest. 4,556,254, Cl. 297-460.000.
Robertson, George H.; and Pavlath, Attila E., to United States of America, Agriculture. Dehydration of ethanol. 4,556,460, Cl. 203-19.000.
Rocep-Lusol Holdings Limited: *See*—
Frutin, Bernard D., 4,556,156, Cl. 222-386.500.
Rock, Erich; and Brunner, Josef, to Julius Blum Gesellschaft m.b.H. Gauging tool. 4,556,205, Cl. 269-2.000.
Rockwood, Clyde R., to D. L. Auld Company, The. Decorative emblem useful in customizing an automobile and other surfaces. 4,556,588, Cl. 428-13.000.
Rodgers, Jack; and Rodgers, Mark F. Hydraulic control system for vacuum sweeper trucks. 4,555,826, Cl. 15-340.000.
Rodgers, Mark F.: *See*—
Rodgers, Jack; and Rodgers, Mark F., 4,555,826, Cl. 15-340.000.
Rodloff, Rudiger K.: *See*—
Gauert, Rolf; Rodloff, Rudiger K.; and Siol, Gerald H., 4,556,319, Cl. 356-350.000.
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Schindler, Frederick J.; and Fulton, Raymond L., Jr., 4,556,701, Cl. 526-282.000.
Rolando, John L. Motion sensing apparatus with variable threshold. 4,556,799, Cl. 250-577.000.
Rolf, Richard L.: *See*—
Peterson, Richard W.; and Rolf, Richard L., 4,556,468, Cl. 204-243.00R.
Roline, Glenn M.: *See*—
Thompson, David L.; Bennett, Robert M.; and Roline, Glenn M., 4,556,063, Cl. 128-419.0PT.
Rollei Fototechnic GmbH: *See*—
Hartung, Hansjurgen, 4,556,301, Cl. 352-78.00R.
Rollins, John P., to Duff-Norton Company, Inc. Control valve apparatus. 4,556,832, Cl. 318-467.000.
Romanow, Peter; and Andreasen, Richard, to Star Manufacturing Company. Rapid response water heating and delivery system. 4,556,168, Cl. 236-25.00A.
Romer, Rudolf; Jaeneke, Christian; Bethmann, Karl W.; and Moll, Manfred, to Rheinmetall GmbH. Method and apparatus for covering a target area with ammunition. 4,555,971, Cl. 89-1.110.

Ronning, Patricia M.; and Vandesteeg, Gregg A., to Minnesota Mining and Manufacturing Company. Compositions for tobacco sucker growth control. 4,556,410, Cl. 71-78.000.

Rooney, John M.: *See*—
Harris, Stephen J.; McKervey, M. Anthony; Melody, David P.; Woods, John; and Rooney, John M., 4,556,700, Cl. 526-209.000.

Rosales, Nancy: *See*—
Tarbox, Max R.; and Rosales, Nancy, 4,556,215, Cl. 272-119.000.

Rose, Andrew M., to Memorex Corporation. Method and apparatus to improve the positioning accuracy of a tracking arm. 4,556,921, Cl. 360-77.000.

Rose, Floyd D. Tremolo apparatus capable of increasing tension on the strings of a musical instrument. 4,555,970, Cl. 84-313.000.

Rosenquist, Niles R., to General Electric Company. Composition. 4,556,704, Cl. 528-196.000.

Ross, Donald K.: *See*—
Drygalski, Gordon T.; Otto, Dennis L.; and Ross, Donald K., 4,556,225, Cl. 277-152.000.

Ross, Ronald J.; and Sherman, John D., to Union Carbide Corporation. Process for the preparation of high-level ion-exchanged forms of Zeolites F and Zeolite W. 4,556,550, Cl. 423-328.000.

Rosseau, Richard B., to FMC Corporation. Debris collection system for street sweepers. 4,555,824, Cl. 15-87.000.

Rossi, Antonio: *See*—
Gervasio, Vincenzo; and Rossi, Antonio, 4,556,801, Cl. 290-44.000.

Roswurm, Mark A., to Westinghouse Electric Corp. Tracking filter for sensing DC content in an AC waveform. 4,556,842, Cl. 324-102.000.

Roszinski, Hilmar: *See*—
Gradl, Reinhard; and Roszinski, Hilmar, 4,556,548, Cl. 423-321.00S.

Roulot, Maurice. Light source with acousto-optic deflector and afocal lens system. 4,556,290, Cl. 350-358.000.

Rourke, Jonathan M.; and Whitney, Daniel E., to Charles Stark Draper Laboratory, Inc., The. Remote center compliance device. 4,556,203, Cl. 267-141.100.

Roussel Uclaf: *See*—
Martel, Jacques; Tessier, Jean; and Demoute, Jean-Pierre, 4,556,732, Cl. 562-577.000.
Tessier, Jean; Demoute, Jean-Pierre; and Cadiergue, Joseph, 4,556,666, Cl. 514-351.000.

Roy, Joseph J. Apparatus and method for communicating digital information on AC power lines. 4,556,864, Cl. 340-310.00A.

Rubinstein, Alan, to Cedars-Sinai Medical Center. Treatment of factor VIII concentrate to minimize the affect of undesirable microorganisms. 4,556,558, Cl. 424-101.000.

Ruckriegel, Michael J.; and McCord, James W. Multi-vapor level vapor generating and recovery apparatus. 4,556,456, Cl. 202-186.000.

Rudolph, Paul; and Hirsch, Martin, to Metallgesellschaft Aktiengesellschaft. Process of gasifying solid fuels in a moving bed and in a fluidized bed. 4,556,402, Cl. 48-197.00R.

Ruoste-Esto Oy: *See*—
Lindberg, Jarl J.; Era, Vaino ; and Strom, Erkki, 4,556,425, Cl. 106-14.230.

Ruppel, Peter: *See*—
Schaut, Josef; Ruppel, Peter; and Hultner, Karl, 4,556,302, Cl. 354-83.000.

Russell, Robert J., to Honeywell Information Systems Inc. Method for testing electronic assemblies. 4,556,840, Cl. 324-73.00R.

Russo, Frank A.; Pauwels, Michael A.; and Bauer, Thomas A., to Allied Corporation. Microprocessor based engine control system for controlling heavy engine loads. 4,556,942, Cl. 364-431.070.

Ryan, Michael C. Soil sampler device. 4,556,114, Cl. 175-20.000.

Rzepka, Herbert: *See*—
Follert, Hans G.; Rzepka, Herbert; and Schwert, Martin, 4,556,256, Cl. 299-33.000.

S. Himmelstein and Company: *See*—
Reich, Richard B., 4,555,956, Cl. 73-862.320.

Saga, Ikuo: *See*—
Kumagai, Naotake; Saga, Ikuo; Tatemoto, Minoru; and Tada, Tetsuya, 4,556,877, Cl. 340-713.000.

St. Clair, David J., to Shell Oil Company. Endblock crosslinked block copolymer adhesive composition. 4,556,464, Cl. 204-159.150.

Saint Gobain Vitrage: *See*—
Kraemling, Franz; Muller, Achim; Linden, Ludwig; and Raedisch, Helmer, 4,556,600, Cl. 428-216.000.
Reinmold, Heinz-Josef; and Arnoldi, Wilhelm, 4,556,834, Cl. 318-569.000.

St. Louis, Robert M., to Camco Inc. Convertible cabinet support. 4,555,827, Cl. 16-34.000.

Saita, Kenji; and Fujioka, Syozo, to Sumitomo Chemical Company, Limited. Heat storage composition. 4,556,501, Cl. 252-70.000.

Saito, Isao: *See*—
Kamuro, Takashi; Ootsuga, Hisao; Saito, Isao; and Koga, Motoyuki, 4,556,580, Cl. 427-8.000.

Saito, Junichi; Kudamatsu, Akio; Kume, Toyohiko; and Tsuboi, Shinichi, to Nihon Tokushu Noyaku Seizo K.K. Phosphonic acid esters as pesticides. 4,556,650, Cl. 514-128.000.

Saito, Norihisa: *See*—
Sugiura, Yoji; Yamamoto, Hironori; Nishida, Keijiro; Shirai, Naoki; Takahashi, Kimio; Nakasugi, Mikio; and Saito, Norihisa, 4,556,285, Cl. 350-600.000.

Saito, Taro; Umeki, Kazumi; Ohno, Takaaki; Sakane, Hirobumi; Tsujino, Masahide; Sanpei, Keiichi; Nagamine, Yoshibumi; and Sato, Yoshitaka, to Kubota Ltd. Structure for attaching tines for cultivation by reversible rotation in rotary cultivating apparatus. 4,556,113, Cl. 172-91.000.

Sakai, Koichi: *See*—
Nishikawa, Hideo; Okamoto, Kenzo; Sakai, Koichi; and Kitada, Fumihiko, 4,556,045, Cl. 126-96.000.

Sakai, Yuhichi: *See*—
Yamura, Hitoo; Ikeda, Kakuro; and Sakai, Yuhichi, 4,556,202, Cl. 266-242.000.

Sakakibara, Naoji: *See*—
Hyodo, Hitoshi; and Sakakibara, Naoji, 4,556,861, Cl. 340-62.000.

Sakamoto, Fumimaro: *See*—
Abe, Shuji; Abe, Tatsumi; and Sakamoto, Fumimaro, 4,556,380, Cl. 425-188.000.

Sakamoto, Junshin; and Shinohara, Shigeru, to Hitachi Koki Company, Limited. Circuit arrangement for electrical tool with clutch. 4,556,831, Cl. 318-434.000.

Sakamoto, Takashi, to Dainippon Screen Seizo Kabushiki Kaisha. Method for scanning a plurality of scanning lines at the same time. 4,556,901, Cl. 358-75.000.

Sakane, Hirobumi: *See*—
Saito, Taro; Umeki, Kazumi; Ohno, Takaaki; Sakane, Hirobumi; Tsujino, Masahide; Sanpei, Keiichi; Nagamine, Yoshibumi; and Sato, Yoshitaka, 4,556,113, Cl. 172-91.000.

Sakashita, Shizuka: *See*—
Motoyama, Shimesu; Kurita, Kaora; Sakashita, Shizuka; Takei, Narimichi; and Ohno, Shigeru, 4,556,175, Cl. 241-57.000.

Sakurai, Kiyomi; and Arimatsu, Seiji, to Nippon Paint Co., Ltd. Method for producing a lithographic printing plate. 4,556,462, Cl. 204-6.000.

Sala International Aktiebolag: *See*—
Eriksson, Bengt O., 4,556,239, Cl. 384-130.000.

Salamone, Ann B.: *See*—
Poulin, Susan B.; and Salamone, Ann B., 4,556,629, Cl. 430-331.000.

Salansky, Norman: *See*—
Pomeranz, Bruce; and Salansky, Norman, 4,556,064, Cl. 128-423.00R.

Salett, Ronald M.: *See*—
Caprio, A. Ronald; Cyr, John P.; Geaghan, Bernard O.; Kotschenreuther, Paul C.; Schanin, David J.; and Salett, Ronald M., 4,556,953, Cl. 364-900.000.

Salzburg, Herbert; Fauss, Rudolf; Findeisen, Kurt; and Homeyer, Bernhard, to Bayer Aktiengesellschaft. Substituted malonic acid diamide insecticides, compositions and use. 4,556,649, Cl. 514-63.000.

Samejima, Yasushi; Shiga, Minoru; Kano, Toshiji; and Yamada, Kiyoshi, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Electrolytic cell with membrane and solid, horizontal cathode plate. 4,556,470, Cl. 204-266.000.

Samsonite Corporation: *See*—
Castelli, Renato, 4,556,144, Cl. 206-214.000.

Sanbuichi, Hiroshi: *See*—
Yamaguchi, Hiroshi; Sawamoto, Kunifumi; Sanbuichi, Hiroshi; Morita, Tatsuo; and Takizawa, Satoshi, 4,556,029, Cl. 123-41.150.

Sanders Associates, Inc.: *See*—
Thompson, Thomas W., 4,556,828, Cl. 318-254.000.

Sanders, Robert N.: *See*—
Laurent, Sebastian M.; and Sanders, Robert N., 4,556,564, Cl. 426-2.000.

Sanderson, John R.; Nieh, Edward C. Y.; and Watts, Lewis W., Jr., to Texaco Inc. Ester compounds from 5-vinyl-2-norbornene. 4,556,730, Cl. 560-256.000.

Sandland, Paul; Chadwick, Curt H.; and Dwyer, Howard I., to KLA Instruments Corporation. X-Y Stage for a patterned wafer automatic inspection system. 4,556,317, Cl. 356-237.000.

Sano, Tsunenori; and Kawaguchi, Kazuo, to Pilot Man-Nen Hitsu Kabushiki Kaisha. Pen core for writing instrument. 4,556,336, Cl. 401-199.000.

Sano, Yasumasa; and Ohwada, Tetsuya, to NSK-Warner K.K.; and Nippon Kinzoku Co., Ltd. Buckle assembly. 4,555,832, Cl. 24-682.000.

Sanpei, Keiichi: *See*—
Saito, Taro; Umeki, Kazumi; Ohno, Takaaki; Sakane, Hirobumi; Tsujino, Masahide; Sanpei, Keiichi; Nagamine, Yoshibumi; and Sato, Yoshitaka, 4,556,113, Cl. 172-91.000.

Sanui, Kohei: *See*—
Ogata, Naoya; Sanui, Kohei; Azuma, Chiaki; Tanaka, Hozumi; Oguchi, Kiyoshi; Takahashi, Yoichi; and Nakada, Tomihiro, 4,556,619, Cl. 430-17.000.

Sanyo Electric Co., Ltd.: *See*—
Tazima, Yoshihisa; Morishima, Masayuki; Okumura, Hiroshi; and Kasahara, Shin-ichi, 4,556,770, Cl. 219-10.49R.

Sanyo-Kokusaku Pulp Co., Ltd.: *See*—
Kubo, Motonobu; and Honda, Kazumi, 4,556,729, Cl. 560-220.000.

Sarcander, Uwe, to Windmoller & Holscher. Method and apparatus for making plastics-coated sanitary webs of paper. 4,556,527, Cl. 264-171.000.

Sargisson, Donald F.; and Toraason, Clifford M., Jr., to General Electric Company. Propeller actuation system. 4,556,366, Cl. 416-155.000.

Sarkozy, Robert F., to BTU Engineering Corporation. Method for providing substantially waste-free chemical vapor deposition of thin-film on semiconductor substrates. 4,556,584, Cl. 427-54.100.

Sarugaku, Shinichi; Tsuchihashi, Akira; and Tsuji, Masao, to Hitachi, Ltd.; and Hitachi Keiyo Engineering Co., Ltd. Method and apparatus for welding line tracer control. 4,556,777, Cl. 219-124.340.

Sasaki, Akira: *See*—
Sunagawa, Makoto; Goda, Koshiro; Enomoto, Masao; and Sasaki, Akira, 4,556,514, Cl. 260-239.00A.

Sasaki, Sadamitsu: *See*—
Tamura, Shohei; Sasaki, Sadamitsu; Sasaki, Takeshi; Ichinose, Hisashi; Nakamoto, Keiji; Abe, Masao; and Nakazawa, Hitoshi, 4,556,623, Cl. 430-83.000.

Sasaki, Shigeru: *See*—
Oishibashi, Hirotsugu; Ueyama, Katsuyoshi; Ohara, Muneyuki; Nakamura, Mitsuo; Aichi, Takeo; and Sasaki, Shigeru, 4,556,164, Cl. 228-199.000.

Sasaki, Takeshi: *See*—
Tamura, Shohei; Sasaki, Sadamitsu; Sasaki, Takeshi; Ichinose, Hisashi; Nakamoto, Keiji; Abe, Masao; and Nakazawa, Hitoshi, 4,556,623, Cl. 430-83.000.

Sasaki, Yoshio: *See*—
Kanto, Noriharu; Hosaka, Yukihiro; Sasaki, Yoshio; Kuramoto, Tatsuo; and Kimura, Masato, 4,555,914, Cl. 62-380.000.

Sasayama, Takao: *See*—
Yamada, Kazuji; Sato, Hideo; Kato, Kazuo; Sasayama, Takao; Kawakami, Kanji; and Kanzawa, Ryosaku, 4,556,807, Cl. 307-491.000.

Sase, Masatoshi: *See*—
Yamanaka, Seisuke; Sase, Masatoshi; Yoshioka, Otamu; and Kajino, Isao, 4,556,912, Cl. 358-213.000.

Sastri, Suri A. Surface coatings and subcoats. 4,556,607, Cl. 428-627.000.

Sato, Hideo: *See*—
Yamada, Kazuji; Sato, Hideo; Kato, Kazuo; Sasayama, Takao; Kawakami, Kanji; and Kanzawa, Ryosaku, 4,556,807, Cl. 307-491.000.

Sato, Ken-ichi; Takano, Satoshi; and Miyazaki, Kenji, to Sumitomo Electric Industries, Ltd. Heat-resistant galvanized iron alloy wire. 4,556,609, Cl. 428-659.000.

Sato, Kozo; Fujita, Shinsaku; Nakamura, Koichi; and Naito, Hideki, to Fuji Photo Film Co., Ltd. Color light-sensitive material. 4,556,632, Cl. 430-562.000.

Sato, Masayoshi: *See*—
Ueno, Masato; Sato, Masayoshi; Tasaka, Mitsuyuki; and Naito, Tatsuro, 4,556,389, Cl. 433-206.000.

Sato, Susumu; Hattori, Tadashi; Ueno, Yoshiki; and Taguchi, Takashi, to Nippon Soken, Inc. Heat reflection film. 4,556,599, Cl. 428-216.000.

Sato, Susumu; and Hara, Yoshio, to Fuji Photo Film Co., Ltd. Self-processing type film unit and method of manufacturing the same. 4,556,631, Cl. 430-498.000.

Sato, Toshiyuki; and Kaida, Tadayuki, to Kabushiki Kaisha Suiken. Universal pipe joint assembly. 4,556,227, Cl. 277-207.00A.

Sato, Yasumasa: *See*—
Kishida, Kazuo; Yamamoto, Naoki; and Sato, Yasumasa, 4,556,692, Cl. 525-78.000.

Sato, Yoshitaka: *See*—
Saito, Taro; Umeki, Kazumi; Ohno, Takaaki; Sakane, Hirobumi; Tsujino, Masahide; Sanpei, Keiichi; Nagamine, Yoshibumi; and Sato, Yoshitaka, 4,556,113, Cl. 172-91.000.

Satoh, Tamataro: *See*—
Yamada, Takemi; Satoh, Tamataro; Mizushina, Masaaki; Toyota, Koji; and Okamoto, Hiromi, 4,556,022, Cl. 123-188.0AA.

Satren, Ernest A.: *See*—
Bohrer, Philip J.; Higashi, Robert E.; Johnson, Timothy L.; and Satren, Ernest A., 4,555,939, Cl. 73-198.000.

Sauerbruch, Ernst F. Apparatus for fitting together cup-like containers and packaging carriers which engage same. 4,555,891, Cl. 53-48.000.

Savarese, Thomas G.: *See*—
Treseder, Robert C.; and Savarese, Thomas G., 4,556,969, Cl. 369-291.000.

Savin Corporation: *See*—
Carr, Roger D., 4,556,211, Cl. 271-221.000.

Sawamoto, Kunifumi: *See*—
Yamaguchi, Hiroshi; Sawamoto, Kunifumi; Sanbuichi, Hiroshi; Morita, Tatsuo; and Takizawa, Satoshi, 4,556,029, Cl. 123-41.150.

Sayles, Scott M.; and Castagnos, Leonce F., Jr., to Texaco Inc. FCCU Catalyst-high velocity vapor separator. 4,556,542, Cl. 422-147.000.

Scantlin, John R.: *See*—
Flanagin, Stephen D.; Bubb, Howard G.; and Scantlin, John R., 4,556,970, Cl. 370-58.000.

Schade, Ekkehard: *See*—
Egli, Walter; Ragaller, Klaus; Schade, Ekkehard; and Stelzer, Roland, 4,556,767, Cl. 200-148.00A.

Schaefer, Frederic C., to American Cyanamid Company. Oligomers and homopolymers of meta- or para-isopropenyl-α,α-dimethylbenzylisocyanate. 4,556,702, Cl. 526-310.000.

Schaeffer, James: *See*—
Leach, Thomas W.; and Schaeffer, James, 4,555,930, Cl. 73-23.000.

Schanin, David J.: *See*—
Caprio, A. Ronald; Cyr, John P.; Geaghan, Bernard O.; Kotschenreuther, Paul C.; Schanin, David J.; and Salett, Ronald M., 4,556,953, Cl. 364-900.000.

Schaut, Josef; Ruppel, Peter; and Hultner, Karl, to SMA Schaut GmbH, Firma. Camera box for microfilm cameras. 4,556,302, Cl. 354-83.000.

Schell, Richard P., to Xerox Corporation. Holographic disc mount. 4,556,278, Cl. 350-3.710.

Schenk, Manfred: *See*—
Gloss, Erwin; Lotterbach, Gerhard; Perenthaler, Egbert; Schenk, Manfred; Van Woudenberg, Jan F.; and Zucker, Udo, 4,556,036, Cl. 123-491.000.

Schering A.G.: *See*—
Erhardt, Paul W.; Hagedorn, Alfred A., III; Lumma, William C., Jr.; and Wohl, Ronald A., 4,556,665, Cl. 514-338.000.

Schering Corporation: *See*—
Andrews, David R.; and Gaeta, Federico C. A., 4,556,655, Cl. 514-222.000.

Schiffner, Gerhard, to Siemens Aktiengesellschaft. Ring interferometer with an arrangement to eliminate false indications. 4,556,321, Cl. 356-350.000.

Schindler, Frederick J.; and Fulton, Raymond L., Jr., to Rohm and Haas Company. Impregnant compositions for porous substrates. 4,556,701, Cl. 526-282.000.

Schlamann, Wilhelm: *See*—
Feldmann, Joachim; and Schlamann, Wilhelm, 4,556,259, Cl. 303-7.000.

Schlanger, Herbert: *See*—
Ward, James W.; Schlanger, Herbert; McNulty, Hugh, Jr.; and Parker, Norman W., 4,556,794, Cl. 250-309.000.

Schleiter, Daniel P., Sr., to Vapor Corporation. Pressure relief valve and method for modification thereof. 4,556,083, Cl. 137-514.000.

Schlick, Horst: *See*—
Wietschorke, Stephan; and Schlick, Horst, 4,556,028, Cl. 123-339.000.

Schlosser, Theodoor A. J.; and Smakman, Theodorus H., to U.S. Philips Corporation. Receiver comprising a search tuning circuit. 4,556,987, Cl. 455-161.000.

Schluter, Hartwig: *See*—
Sievers, Willi; Schluter, Hartwig; and de Vries, Gerhard, 4,556,376, Cl. 425-133.500.

Schmerda, Richard F.: *See*—
Brifman, Josef; Chacon, M. Frank; Schmerda, Richard F.; and Smith, Frank E., 4,556,882, Cl. 340-825.060.

Schmid, Carl E., to Perkin-Elmer Corporation, The. Solvent delivery system. 4,556,367, Cl. 417-18.000.

Schmid, Rudolf: *See*—
Hansen, Hans-Jurgen; and Schmid, Rudolf, 4,556,740, Cl. 568-13.000.

Schmuck, Klaus: *See*—
Klug, Lothar; and Schmuck, Klaus, 4,555,900, Cl. 57-355.000.

Schneider, Otto: *See*—
Bloch, Peter; Schaeider, Otto; and Donner, Meinrad, 4,555,871, Cl. 51-52.00R.

Scholz, Hans J.; and Patzelt, Helmut, to Daimler-Benz AG. Inflatable gas cushion. 4,556,236, Cl. 280-729.000.

Schommler, Manfred, to Werner H.K. Peters Maschinenfabrik GmbH. Heating device for corrugated cardboard in a corrugated cardboard pasting machine. 4,556,444, Cl. 156-359.000.

Schott, John E.: *See*—
Bernhardt, Frederick W.; and Schott, John E., 4,556,350, Cl. 411-10.000.

Schreiber, William L.: *See*—
Fujioka, Futoshi; Boden, Richard M.; and Schreiber, William L., 4,556,746, Cl. 568-648.000.

Schultz, Charles J. Defense weapon. 4,555,848, Cl. 30-297.000.

Schultz, James D. Collapsible ship and model kit. 4,556,395, Cl. 446-160.000.

Schultz, Rainer M. Apparatus for preventing unintentional bending or jackknifing and for improving lateral travelling stability in an articulated vehicle. 4,556,231, Cl. 280-432.000.

Schulz, Frank C., Jr., to Barton Mines Corporation, Inc. Optical counting device. 4,556,297, Cl. 350-529.000.

Schumacher, Hans: *See*—
Olderdissen, Ulrich; and Schumacher, Hans, 4,556,977, Cl. 371-37.000.

Schustek, Siegfried: *See*—
Beisse, Achim; Harer, Helmut; Mohr, Adolf; and Schustek, Siegfried, 4,556,809, Cl. 310-114.000.

Schutzle, Gunter; and Reichardt, Manfred, to Allied Corporation. Housing for plug connector. 4,556,270, Cl. 339-91.00R.

Schwalm, Charles L.; and Hill, Walter A., to Canadian General Electric Company Limited. Speed controller for mill drives and the like. 4,556,830, Cl. 318-326.000.

Schwartz, Anne L.: *See*—
Lenox, Ronald S.; Schwartz, Anne L.; and Hoyle, Charles E., 4,556,625, Cl. 430-145.000.

Schwarz, Albert J.: *See*—
Kowal, Leonard J.; and Schwarz, Albert J., 4,556,242, Cl. 285-341.000.

Schwarz, William M., Jr.: *See*—
Gundlach, Robert W.; Schwarz, William M., Jr.; and Gunther, Kenneth W., 4,556,013, Cl. 118-624.000.

Schwerdt, Friedrich W.: *See*—
Greschner, Johann; Schwerdt, Friedrich W.; and Trumpp, Hans J., 4,556,628, Cl. 430-314.000.

Schwert, Martin: *See*—
Follert, Hans G.; Rzepka, Herbert; and Schwert, Martin, 4,556,256, Cl. 299-33.000.

Schwind, Richard J.: *See*—
Wollar, Burnell J.; and Schwind, Richard J., 4,556,351, Cl. 411-38.000.

Schwing, Friedrich, to Friedrich Wilh. Schwing GmbH. Twin cylinder pumps, more specially for concrete. 4,556,370, Cl. 417-517.000.

Schwuttke, Gunther H.: *See*—
Kim, Kyong M.; Smetana, Pavel; and Schwuttke, Gunther H., 4,556,448, Cl. 156-605.000.

Scott, Gary W.; and Cox, Aaron J., to University of California. Piezoelectrically tuned short cavity dye laser. 4,556,979, Cl. 372-20.000.

Scott, Graham W.; and Steven, James H., to Imperial Industries plc. Method of concentrating silica in an aqueous alkali metal silicate solution. 4,556,465, Cl. 204-182.200.

Scott, Graham W.; and Steven, James H., to Imperial Chemical Industries plc. Method of concentrating silica in an aqueous alkali metal silicate solution. 4,556,466, Cl. 204-182.200.

Scott, Raymond P. W., to Perkin-Elmer Corporation, The. Multifunctional detector. 4,555,936, Cl. 73-61.10C.

Scrudato, Frederick, to Finast Marking Supplies Inc. Disposable ink cartridge. 4,556,012, Cl. 118-268.000.

Sealed Power Corporation: *See*—
Warrick, Frank G., 4,556,085, Cl. 137-625.650.

Sears, I. Weir; Hostetler, John E.; and Hulsebusch, William H., to Apparel Form Company. Method of forming cloth into three-dimensional shapes and the articles produced by that method. 4,555,814, Cl. 2-227.000.

Sedlatschek, Robert; and McGann, Leo E., to Singer Company, The. Sewing machine frame comprising oriented reinforced fibers. 4,556,594, Cl. 428-83.000.

Seebohm, Robert P.: *See*—
Spector, Marshall L.; Hong, Sun-nan; and Seebohm, Robert P., 4,556,491, Cl. 210-608.000.

Seiler, Claus-Dietrich; and Vahlensieck, Hans-Joachim, to Dynamit Nobel AG. Method for the preparation of mercapto alkyl silanes. 4,556,724, Cl. 556-429.000.

Seiler, Herbert: *See*—
Hegar, Gert; and Seiler, Herbert, 4,556,706, Cl. 534-618.000.

Seki, Masaki: *See*—
Kishi, Hajimu; Seki, Masaki; Tanaka, Kunio; and Takegahara, Takashi, 4,556,833, Cl. 318-567.000.

Sekimura, Nobuyuki, to Canon Kabushiki Kaisha. Liquid crystal device with anti-reflection function in dielectric layer. 4,556,288, Cl. 350-339.00R.

Seliger, Robert L.: *See*—
McKenna, Charles M.; Clark, William M., Jr.; and Seliger, Robert L., 4,556,798, Cl. 250-492.200.

Semenets, Valery I.: *See*—
Baldenko, Dmitry F.; Vadetsky, Jury V.; Goldobin, Vladimir B.; Gusman, Moisei T.; Kochnev, Anatoly M.; Nikomarov, Samuil S.; and Semenets, Valery I., 4,556,398, Cl. 464-16.000.

Semrow, Carolyn M., to Kendall Company, The. Ultrasound acoustical coupling pad. 4,556,066, Cl. 128-660.000.

Senor, Ronald E., to Texas Instruments Incorporated. Integrated circuit mounting socket. 4,556,267, Cl. 339-59.00M.

Sequeira, Luis: *See*—
Paau, Alan; Platt, Steven G.; and Sequeira, Luis, 4,556,643, Cl. 436-501.000.

Serex, Vern L. Portable ski rest. 4,556,252, Cl. 297-438.000.

Serrano, Francisco de Asis M.: *See*—
Lamy, Jacques E.; and Serrano, Francisco de Asis M., 4,556,004, Cl. 114-61.000.

Servas, Francis M.: *See*—
Diettrich, Lambert J., Jr.; and Servas, Francis M., 4,556,489, Cl. 210-321.300.

Service National Electricite de France: *See*—
Bordet, Rene ; Grovalet, Yves; Caudron, Lionel; and Diver, Marius, 4,555,881, Cl. 52-167.000.

Sever, John I. Tractor-trailer coupling device. 4,556,232, Cl. 280-432.000.

Shachihata Kogyo K.K.: *See*—
Nagata, Sumio; Kanaiwa, Kazuhide; and Ichikawa, Takashi, 4,556,096, Cl. 164-79.000.

Shapland, Earl P., to Flo-Con Systems, Inc. Pressure fluid teeming valve and method. 4,556,157, Cl. 222-600.000.

Sharma, Devendra N. Reversible playing or performance area. 4,556,213, Cl. 272-3.000.

Sharp Kabushiki Kaisha: *See*—
Funada, Fumiaki; Matsura, Masataka; and Wada, Tomio, 4,556,287, Cl. 350-336.000.

Shaw, Arthur W.; and Gepner, Isadore, to Pittway Corporation. Security interface system for a door, window or the like. 4,556,765, Cl. 200-61.710.

Shaw, Herbert J.; and Digonnet, Michel J. F., to Leland Stanford Junior University, Board of Trustees of the. Passive fiber optic multiplexer. 4,556,279, Cl. 350-96.150.

Shaw, James E., to Phillips Petroleum Company. Immiscible displacement of oil with surfactant system. 4,556,495, Cl. 252-8.55D.

Sheleg, Boris: *See*—
Chiang, Bing; and Sheleg, Boris, 4,556,855, Cl. 333-113.000.

Shell Oil Company: *See*—
Ayers, Ray R., 4,556,341, Cl. 405-195.000.
St. Clair, David J., 4,556,464, Cl. 204-159.150.
van der Scheer, Albert; and Reynhout, Marinus J., 4,556,530, Cl. 264-298.000.

Shenoy, Thirthahalli A.; and Losin, Martha S., to Air Products and Chemicals, Inc. Split-column extractive distillation. 4,556,404, Cl. 62-17.000.

Sheppard, Howard H. Method and structure of individually shielded, relay, pickup and holding coils, to reduce the effects of external and internal transients. 4,556,859, Cl. 335-301.000.

Sherer, Robert B.: *See*—
Brenner, Robert A.; and Sherer, Robert B., 4,555,919, Cl. 68-134.000.

Sherman, John D.: *See*—
Ross, Ronald J.; and Sherman, John D., 4,556,550, Cl. 423-328.000.

Shetter, Jerrold K.: *See*—
Doorley, Richard B.; Henninger, Paul J.; Klages, Chester F., Jr.; and Shetter, Jerrold K., 4,556,127, Cl. 184-3.100.

Shia, George A., to Allied Corporation. Battery electrode and method of making. 4,556,618, Cl. 429-217.000.

Shiba, Kunio: *See*—
Murakami, Yoshiaki; Shiba, Kunio; Yoshitake, Akira; Takahashi, Keietsu; Ueda, Nobuo; and Hazue, Masaaki, 4,556,689, Cl. 525-54.100.

Shibahara, Seiji; Okonogi, Tsuneo; Murai, Yasushi; Fukatsu, Shunzo; Niida, Taro; and Wakazawa, Tadashi, to Meiji Seika Kaisha, Ltd. Process for the production of antibiotic 1-oxadethiacephalosporins, and intermediate. 4,556,513, Cl. 260-239.00A.

Shibata, Akira, to Chugai Denki Kogyo, K.K. Method for preparing cores and the like made from metallic oxides. 4,556,435, Cl. 148-6.350.

Shibata, Akira; and Komatsu, Keiichi, to Hitachi, Ltd. Magnetic recording/reproducing apparatus for video and sound. 4,556,917, Cl. 358-343.000.

Shibata, Takehiko; and Yokomizo, Yoshikazu, to Canon Kabushiki Kaisha. Image reproduction device. 4,556,915, Cl. 358-280.000.

Shibukawa, Mitsuru; Shibuya, Chisei; and Ishii, Kunihiko, to Asahi Kasei Kogyo Kabushiki Kaisha. Secalonic acid derivatives as antitumor agents. 4,556,651, Cl. 514-191.000.

Shibuya, Chisei: *See*—
Shibukawa, Mitsuru; Shibuya, Chisei; and Ishii, Kunihiko, 4,556,651, Cl. 514-191.000.

Shiga, Minoru: *See*—
Samejima, Yasushi; Shiga, Minoru; Kano, Toshiji; and Yamada, Kiyoshi, 4,556,470, Cl. 204-266.000.

Shigematsu, Kazuo: *See*—
Tsunoda, Yoshito; Miyauchi, Toshimitsu; and Shigematsu, Kazuo, 4,556,965, Cl. 369-45.000.

Shiley Incorporated: *See*—
Diettrich, Lambert J., Jr.; and Servas, Francis M., 4,556,489, Cl. 210-321.300.

Shimalla, Charles J., to Chicopee. Extensible microfine fiber laminate. 4,555,811, Cl. 2-51.000.

Shimizu, Junichi: *See*—
Takazoe, Ichiro; Ohta, Kosei; Shimizu, Junichi; Suzuki, Kazumasa; Iwakura, Tatsuya; and Nakajima, Yoshikazu, 4,556,429, Cl. 127-30.000.

Shimizu, Osamu; Goto, Hirofumi; and Matsukawa, Fumio, to Mitsubishi Jidosha Kogyo Kabushiki Kaisha; and Mitsubishi Denki Kabushiki Kaisha. Display device with delay time compensation. 4,556,876, Cl. 340-713.000.

Shimizu, Wataru; and Yamashita, Akira, to Kabushiki Kaisha S G. Phase shift type linear position detection device. 4,556,886, Cl. 340-870.320.

Shimogawa, Toshiaki: *See*—
Kuwakado, Satosi; Shimogawa, Toshiaki; Koide, Teruhiko; Kanada, Shigeyasu; and Iwatsuki, Masahiro, 4,556,177, Cl. 242-107.40A.

Shin-Ei Kabushiki Kaisha: *See*—
Agata, Akihiko, 4,556,018, Cl. 122-35.000.

Shinagawa Shoko Co., Ltd.: *See*—
Nakamura, Toshinobu, 4,556,181, Cl. 248-74.100.

Shinohara, Shigeru: *See*—
Sakamoto, Junshin; and Shinohara, Shigeru, 4,556,831, Cl. 318-434.000.

Shinozaki, Nozomu: *See*—
Neki, Shigeo; Shinozaki, Nozomu; and Morofuji, Takeshi, 4,556,001, Cl. 112-277.000.

Shioda, Masahiko: *See*—
Oaku, Takaaki; Shioda, Masahiko; Suzuki, Syunsuke; and Maki, Yoshihiro, 4,556,533, Cl. 419-11.000.

Shioiri, Tomonori; and Ino, Takashi, to Research Association for Residual Oil Processing. Hydrocarbon conversion process and catalyst composition. 4,556,478, Cl. 208-120.000.

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Tanaka, Kentaro; and Tsuji, Naoki, 4,556,517, Cl. 260-245.20T.

Shirai, Naoki: *See*—
Sugiura, Yoji; Yamamoto, Hironori; Nishida, Keijiro; Shirai, Naoki; Takahashi, Kimio; Nakasugi, Mikio; and Saito, Norihisa, 4,556,285, Cl. 350-600.000.

Shiratsuchi, Kouji, to Honda Giken Kogyo Kabushiki Kaisha. Motorcycle structure. 4,556,119, Cl. 180-219.000.

Shishido, Yoshio; Nishigaki, Shinichi; Kato, Shinichi; Matsuo, Kazumasa; Miyazaki, Atsushi; Takahashi, Susumu; Nakamura, Takeaki; and Ishikawa, Akibumi, to Olympus Optical Co., Ltd. Photosensor for optical observing or photographing devices. 4,556,787, Cl. 250-201.000.

Shoemaker, Leon H., to National Mine Service Company. Re-railing jack. 4,556,200, Cl. 254-424.000.

Shoji, Masashi, to NEC Corporation. Comparator circuit having hysteresis voltage substantially independent of variation in power supply voltage. 4,556,805, Cl. 307-359.000.

Shotaro, Yokoyama; and Takashi, Nishibe, to Fuji Electric Company, Ltd. Measuring circuit for photo-receiving intensity of photosensor. 4,556,789, Cl. 250-206.000.

Showa Aluminum Corporation: *See*—
Otsuka, Ryotatsu; Tanimoto, Sigemi; and Toyoda, Kazuo, 4,556,419, Cl. 75-68.00R.

Showalter, Howard D. H.; Johnson, Judith L.; Werbel, Leslie M.; and Elslager, Edward F., to Warner-Lambert Company. Antimicrobial

substituted anthra[1,9-cd]pyrazol-6(2H)-ones. 4,556,654, Cl. 514-222.000.
Sichler, Wolfgang. Connector fitting with an electrical heating wire. 4,555,834, Cl. 29-33.00K.
Sidorov, Anatoly S.: *See*—
Aspiotis, Evgeny K.; Vitjuk, Boris Y.; Malakhov, Evgeny I.; Danshin, Boris V.; Sokolov, Vladimir A.; Sidorov, Anatoly S.; and Volkov, Leonid V., 4,556,847, Cl. 324-307.000.
Siedle, Allen R.; and Howells, Richard D., to Minnesota Mining and Manufacturing Company. Fluorochemical rhodium compounds. 4,556,720, Cl. 556-22.000.
Sieke, Helmut. Apparatus for treating dispersions and the like with non-sinusoidal vibration. 4,556,174, Cl. 241-1.000.
Siemens Aktiengesellschaft: *See*—
Albersdoerfer, Otto; Blankenfeld, Heinz; Kranz, Wolfgang; and Weckwerth, Wolfgang, 4,556,284, Cl. 350-174.000.
Harle, Hans G., 4,556,868, Cl. 340-347.0DD.
Mathyssek, Konrad; and Mahlein, Hans, 4,556,292, Cl. 350-394.000.
Schiffner, Gerhard, 4,556,321, Cl. 356-350.000.
Sievers, Willi; Schluter, Hartwig; and de Vries, Gerhard, to Continental Gummi-Werke Aktiengesellschaft. Extruder head for producing flat cohesive profiled webs from resilient mixtures of differing composition. 4,556,376, Cl. 425-133.500.
Silver, Frederick, to Fred Silver & Company, Inc. Light powered rotating detection mirror. 4,556,299, Cl. 350-603.000.
Siminerio, Andrew C.: *See*—
Fecik, Michael T.; Frank, Robert G.; Ewing, John J.; and Siminerio, Andrew C., 4,556,407, Cl. 65-289.000.
Simmering-Graz-Pauker Aktiengesellschaft: *See*—
Raggam, Augustin; and Rabitsch, Hermann, 4,556,452, Cl. 162-233.000.
Sinclair, Stuart W., to Anderson, Clayton & Co. Load carrying clamp attachment for a lift truck. 4,556,359, Cl. 414-621.000.
Singer Company, The: *See*—
Sedlatschek, Robert; and McGann, Leo E., 4,556,594, Cl. 428-83.000.
Tancs, Tibor L., 4,555,997, Cl. 112-121.110.
Singer, Hans S., to Hans S. Singer Co., Inc. Holder for yarn package. 4,556,178, Cl. 242-130.000.
Siol, Gerald H.: *See*—
Gauert, Rolf; Rodloff, Rudiger K.; and Siol, Gerald H., 4,556,319, Cl. 356-350.000.
Skiles, Jerry W.: *See*—
Suh, John T.; Skiles, Jerry W.; Piwinski, John J.; Menard, Paul; and Jones, Howard, 4,556,652, Cl. 514-211.000.
Slater Electric Inc.: *See*—
Devitt, Charles J.; Freeman, LeRoy M.; and Slater, Saul I., 4,556,863, Cl. 340-81.00R.
Slater, Robert A.: *See*—
Emmett, John C.; Slater, Robert A.; and Warrington, Brian H., 4,556,711, Cl. 544-357.000.
Slater, Saul I.: *See*—
Devitt, Charles J.; Freeman, LeRoy M.; and Slater, Saul I., 4,556,863, Cl. 340-81.00R.
SMA Schaut GmbH, Firma: *See*—
Schaut, Josef; Ruppel, Peter; and Hultner, Karl, 4,556,302, Cl. 354-83.000.
Smakman, Theodorus H.: *See*—
Schloaser, Theodoor A. J.; and Smakman, Theodorus H., 4,556,987, Cl. 455-161.000.
Smetana, Pavel: *See*—
Kim, Kyong M.; Smetana, Pavel; and Schwuttke, Gunther H., 4,556,448, Cl. 156-605.000.
Smith, David W.; and Wyatt, Richard, to British Telecommunications. Laser light sources. 4,556,980, Cl. 372-28.000.
Smith, Donald F., Jr.: *See*—
Corcoran, Richard J.; Kopf, Peter W.; and Smith, Donald F., Jr., 4,556,693, Cl. 525-162.000.
Smith, Frank E.: *See*—
Brifman, Josef; Chacon, M. Frank; Schmerda, Richard F.; and Smith, Frank E., 4,556,882, Cl. 340-825.060.
Smith, Gregory A., to Lyall Electric, Inc. Mold for grommet mounted connector. 4,556,190, Cl. 249-99.000.
Smith Kline & French Laboratories Ltd.: *See*—
Emmett, John C.; Slater, Robert A.; and Warrington, Brian H., 4,556,711, Cl. 544-357.000.
Smith, Philip C.: *See*—
Smith, Teresa B.; and Smith, Philip C., 4,556,975, Cl. 371-10.000.
Smith, Roderick L., to Energy-Adaptive Grinding, Inc. Method and apparatus for wheel conditioning in a grinding machine. 4,555,873, Cl. 51-165.870.
Smith, Teresa B.; and Smith, Philip C., to Westinghouse Electric Corp. Programmable redundancy circuit. 4,556,975, Cl. 371-10.000.
Smiths Industries Public Limited Company: *See*—
Capaldi, Nicholas R.; and Griffin, Brian W., 4,555,946, Cl. 73-517.00B.
Smoot, Jeffrey B.: *See*—
Vitek, Richard K.; and Smoot, Jeffrey B., 4,556,914, Cl. 358-244.000.
Snamprogetti S.p.A.: *See*—
Gervasio, Vincenzo; and Rossi, Antonio, 4,556,801, Cl. 290-44.000.
Snell, Thomas B.; and Kerton, Peter S. Lifting devices. 4,556,016, Cl. 119-102.000.
Snitman, David L.; Haslanger, Martin F.; and Sprague, Peter W., to E. R. Squibb & Sons, Inc. 7-Oxabicycloheptane and 7-oxabicycloheptene compounds. 4,556,675, Cl. 514-469.000.
Snow, Richard F., to Cooper Industries, Inc. Adjustable lighting luminaire. 4,556,936, Cl. 362-371.000.
Societa' Cavi Pirelli S.p.A.: *See*—
Vecellio, Bernardino, 4,556,756, Cl. 174-25.00R.
Societe Alsacienne de Construction de Material Textile: *See*—
Juillard, Yves, 4,556,089, Cl. 139-453.000.
Societe Anonyme dite: Societe Metallurgique Haut-Marnaise: *See*—
Picaud, Michel M. R., 4,556,080, Cl. 137-296.000.
Societe Francaise Hoechst: *See*—
Chastrette, Francine; Bracoud, Corinne; and Chastrette, Maurice, 4,556,718, Cl. 549-449.000.
Societe Industrielle de Sonceboz S.A.: *See*—
Antognini, Luciano, 4,556,836, Cl. 318-696.000.
Societe Nationale Elf Aquitaine: *See*—
Armand, Michel B.; and El Kadiri Cherkaoui el Moursli, Fouzia, 4,556,616, Cl. 429-192.000.
Societe Nationale Industrielle et Aerospatiale: *See*—
Cahuzac, Georges J. J., 4,555,918, Cl. 66-119.000.
Jumel, Jean-Pierre, 4,555,967, Cl. 83-106.000.
Mouille, Rene L.; and Leman, Jean-Luc M., 4,556,365, Cl. 416-134.00A.
Sodervall, Marja-Liisa; Kurkela, Kauko O. A.; Karjalainen, Arto J.; Toivola, Reijo J.; Kangas, Lauri V. M.; and Blanco, Guillermo L., to Farmos Group Ltd. Alkane and alkene derivatives and their use. 4,556,677, Cl. 514-651.000.
Soeters, Raymond A., Jr., to Eaton Corporation. Supercharger carryback pulsation damping means. 4,556,373, Cl. 418-75.000.
Sokolov, Vladimir A.: *See*—
Aspiotis, Evgeny K.; Vitjuk, Boris Y.; Malakhov, Evgeny I.; Danshin, Boris V.; Sokolov, Vladimir A.; Sidorov, Anatoly S.; and Volkov, Leonid V., 4,556,847, Cl. 324-307.000.
Solie, Leland P., to Sperry Corporation. Three wave surface acoustic wave (SAW) signal processor. 4,556,949, Cl. 364-821.000.
Soltrac, Inc.: *See*—
Jean, Benoit; Bergevin, Benoit; and Rheault, Fernand, 4,556,368, Cl. 417-208.000.
Somers, Lowell M. Benzoylecgonine, benzoylnorecgonine and ecgonine as active agents for the treatment of rheumatoid arthritis and osteoarthritis. 4,556,663, Cl. 514-304.000.
Sonobe, Toshimitsu, to Thomas & Betts Corporation. Jumper wire material. 4,556,266, Cl. 339-29.00R.
Sony Corporation: *See*—
Nakajima, Kaoru, 4,556,611, Cl. 428-694.000.
Numata, Kiyoshi; Yoshida, Toshihiro; and Kokubo, Takashi, 4,556,283, Cl. 350-117.000.
Yamanaka, Seisuke; Sase, Masatoshi; Yoshioka, Osamu; and Kajino, Isao, 4,556,912, Cl. 358-213.000.
Sorenson, David A.: *See*—
Pausch, Josef; and Sorenson, David A., 4,556,173, Cl. 239-533.130.
Sorli, Duncan C.; and Keightley, John H., to Polaroid Corporation. Film processing apparatus including a vacuum pickup head for a film processing fluid container. 4,556,306, Cl. 354-304.000.
Soumai, Masamichi: *See*—
Ogura, Shunichiro; and Soumai, Masamichi, 4,556,461, Cl. 203-29.000.
Southco, Inc.: *See*—
Bisbing, Robert H., 4,556,244, Cl. 292-65.000.
Soyer, Wolfgang: *See*—
Kemmner, Ulrich; and Soyer, Wolfgang, 4,556,490, Cl. 210-349.000.
Spector, Donald. Disc-playing aroma generator. 4,556,539, Cl. 422-125.000.
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Speigel, Kenneth, to North American Philips Consumer Electronics Corporation. Negative-working dichromate photoresist composition, process for applying it to a polymethyl methacrylate surface, and article produced. 4,556,626, Cl. 430-274.000.
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Cohn, Martin; and Welch, Terry A., 4,556,960, Cl. 364-900.000.
Kregness, Glen R.; Criswell, Peter B.; and DeKarske, Clarence W., 4,556,978, Cl. 371-49.000.
Solie, Leland P., 4,556,949, Cl. 364-821.000.
Spillman, William B., Jr., 4,556,791, Cl. 250-225.000.
Spillman, William B., Jr., to Sperry Corporation. Photoelastic sensor using a variable intensity light source as a feedback means. 4,556,791, Cl. 250-225.000.
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Melzer, Hans-Harald; and Spindebock, Wolf-Dieter, 4,555,904, Cl. 60-605.000.
Sprague, Peter W.: *See*—
Snitman, David L.; Haslanger, Martin F.; and Sprague, Peter W., 4,556,675, Cl. 514-469.000.
Stahl, Karl-Heinz. Resonant burner and starting mechanism therefor. 4,556,383, Cl. 431-1.000.
Stalder, Martin: *See*—
Nyfeler, Alex; Gehr, Peter; Stalder, Martin; and Antes, Gregor, 4,556,378, Cl. 425-143.000.
Standard Oil Company, The: *See*—
Curatolo, Benedict S.; and Coffey, Gerald P., 4,556,697, Cl. 525-434.000.
Guttmann, Andrew T.; and Grasselli, Robert K., 4,556,731, Cl. 562-546.000.
Standard Register Company, The: *See*—
Maierson, Theodore, 4,556,687, Cl. 524-333.000.

Stanich, Judith A. Padlock cover. 4,555,920, Cl. 70-54.000.

Stanley Electric Co., Ltd.: *See—*
Uchida, Tatsu; Teshima, Toru; Wada, Masanobu, deceased; Wada, Masami, heir; and Makuta, Yuri, heiress, 4,556,286, Cl. 350-335.000.

Stapp, Paul R.: *See—*
Wu, Yulin; and Stapp, Paul R., 4,556,111, Cl. 166-310.000.

Star Manufacturing Company: *See—*
Romanow, Peter; and Andreasen, Richard, 4,556,168, Cl. 236-25.00A.

Stauffer Chemical Company: *See—*
Leone-Bay, Andrea; and Timony, Peter E., 4,556,412, Cl. 71-92.000.
Swartz, William E.; Everson, Charles W.; and Bender, Fredric G., 4,55(,571, Cl. 426-265.000.

Stefansson, Rafn, to Bell & Howell Company. Information printing methods and apparatus. 4,556,333, Cl. 400-58.000.

Steger, James O., to Gilbarco, Inc. Intrinsically safe signal coupler. 4,556,927, Cl. 361-215.000.

Stein Heurtey S.A.: *See—*
Denis, Michel, 4,556,385, Cl. 432-122.000.

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Quist, Frederick F., Jr.; and Steinbrecher, Marc L., 4,556,924, Cl. 360-106.000.

Stelzer, Roland: *See—*
Egli, Walter; Ragaller, Klaus; Schade, Ekkehard; and Stelzer, Roland, 4,556,767, Cl. 200-148.00A.

Stengle, Barry J.: *See—*
Cawi, Vernon A.; and Stengle, Barry J., 4,556,480, Cl. 208-211.000.

Stern, Richard M., to Riker Laboratories, Inc. 6-Fluoro-5-nitroquinaldine. 4,556,713, Cl. 546-180.000.

Steven, James H.: *See—*
Scott, Graham W.; and Steven, James H., 4,556,465, Cl. 204-182.200.
Scott, Graham W.; and Steven, James H., 4,556,466, Cl. 204-182.200.

Stevens, David R.: *See—*
Wiesehahn, Gary P.; Giles, Richard E.; and Stevens, David R., 4,556,556, Cl. 424-89.000.

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Trussler, Ronald C.; Stevenson, Andrew C.; and Eastcott, Peter D., 4,556,826, Cl. 318-92.000.

Stewart, Donald F.; Tubridy, Michael F.; and Huthwaite, Herbert J., to Allied Corporation. Process to form film from blends of polycaprolactam and poly(hexamethylene adipamide). 4,556,696, Cl. 525-432.000.

Steyr-Daimler-Puch Aktiengesellschaft: *See—*
Zedrosser, Ulrich, 4,555,860, Cl. 42-25.000.

Stibolt, Paul E. Security window cover. 4,555,867, Cl. 49-67.000.

Stiff, Rodney A.; Baker, Malcolm J.; and Lester, Leslie J., to Versatile Corporation. Cane harvester. 4,555,896, Cl. 56-13.900.

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Kurz, Josef; and Stinglwagner, Andrea, 4,556,160, Cl. 225-67.000.

Stoddard, John P., to Ford Motor Company. Flip-down pushbutton end caps for a radio tuner. 4,555,958, Cl. 74-10.330.

Stone, Emory B. Climbing animal barrier. 4,555,866, Cl. 47-23.000.

Stone, Julian, to AT&T Bell Laboratories. Dispersion determining method and apparatus. 4,556,314, Cl. 356-73.100.

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Gartside, Robert J.; and Woebcke, Herman N., 4,556,541, Cl. 422-145.000.

Stopansko Obedinenie "Quarz": *See—*
Lyutzkanov, Stoyan S.; and Bojkov, Dimiter K., 4,555,995, Cl. 110-335.000.

Storage Technology Partners II: *See—*
Pelkey, Kathleen; and Kalk, Franklin, 4,556,968, Cl. 369-287.000.

Stotz, Wolf-Gunter: *See—*
Dahl, Hans; Holik, Herbert; Kurtz, Rudiger; and Stotz, Wolf-Gunter, 4,556,454, Cl. 162-358.000.

Stow & Davis Furniture Company: *See—*
Gzym, Larry P.; Ritzema, Lloyd G.; and Haadsma, David K., Jr., 4,555,880, Cl. 52-126.400.

Strecker, William D.: *See—*
Dickman, Lloyd I.; and Strecker, William D., 4,556,951, Cl. 364-900.000.

Streefkerk, Willem L.: *See—*
Koudstaal, Willem; and Streefkerk, Willem L., 4,556,349, Cl. 410-140.000.

Strietzel, Rainer, to Brown, Boveri & Cie AG. Transmitting and receiving circuit for an apparatus for the automatic identification of objects and/or living organisms. 4,556,883, Cl. 340-825.540.

Stroh Brewery Company, The: *See—*
Elert, Karl, 4,555,935, Cl. 73-52.000.

Strom, Erkki: *See—*
Lindberg, Jarl J.; Era, Vaino ; and Strom, Erkki, 4,556,425, Cl. 106-14.230.

Strope, Douglas H.; and Wray, Thomas E., to International Business Machines Corporation. Method for monitoring deposition rate using an eddy current detector. 4,556,845, Cl. 324-230.000.

Studiengesellschaft Kohle MBH: *See—*
Bonnemann, Helmut; and Bogdanovic, Borislav, 4,556,719, Cl. 556-13.000.

Stuetz, Gerhard: *See—*
Martin, Hans; and Stuetz, Gerhard, 4,556,138, Cl. 192-58.00B.

Sturges, Fred D., to Borg-Warner Corporation. Coolant/refrigerant temperature control system. 4,555,910, Cl. 62-184.000.

Suchy, Milos: *See—*
Dorn, Franz; Montavon, Francois; and Suchy, Milos, 4,556,661, Cl. 514-277.000.
Frater, Georg; Suchy, Milos; Wenger, Jean; and Winternitz, Paul, 4,556,413, Cl. 71-94.000.

Sudo, Kunikane: *See—*
Yamamoto, Toshiki; Kiriu, Yukio; Tsuneoka, Akira; and Sudo, Kunikane, 4,556,099, Cl. 164-451.000.

Sueddeutsche Kuehlerfabrik, Julius Fr. Behr GmbH & Co. KG: *See—*
Martin, Hans; and Stuetz, Gerhard, 4,556,138, Cl. 192-58.00B.

Suenaga, Masahide; Chida, Kousaku; and Ohura, Masaki, to Hitachi, Ltd. Magnetoresistive head. 4,556,925, Cl. 360-113.000.

Sugano, Kazuhiko, to Nissan Motor Co., Ltd. Hydraulic control system for automatic transmission with shockless 4–3 shifting as well as shockless 2–3 shifting. 4,555,964, Cl. 74-869.000.

Suganuma, Nobuo; Tanaka, Kensuke; Takada, Nobuyuki; and Ichikawa, Hiromichi, to Lion Corporation. Toothpaste composition. 4,556,553, Cl. 424-52.000.

Sugawara, Norio; Nawa, Motoyuki; and Takahashi, Yutaka, to Matsushita Electric Industrial Co. Ltd. Flow direction controller. 4,556,172, Cl. 239-590.500.

Sugihara, Atsushi: *See—*
Yamawaki, Satoshi; Sugihara, Atsushi; Kobayashi, Yasushi; Ishida, Hiroshi; Kuramasu, Yukio; and Gotoh, Ichisei, 4,556,165, Cl. 228-223.000.

Sugio, Akitoshi; Masu, Masanobu; and Kobayashi, Toshihiko, to Mitsubishi Gas Chemical Company, Inc. Polyphenylene ether resin composition. 4,556,685, Cl. 524-141.000.

Sugita, Yutaka: *See—*
Imura, Ryo; Ikeda, Tadashi; Takeuchi, Teruaki; Umezaki, Hiroshi; Suzuki, Ryo; and Sugita, Yutaka, 4,556,582, Cl. 427-38.000.
Imura, Ryo; Ikeda, Tadashi; Takeuchi, Teruaki; Ohta, Norio; and Sugita, Yutaka, 4,556,583, Cl. 427-38.000.

Sugitani, Junichi: *See—*
Miyamoto, Hirofumi; Kaitatsu, Nobuaki; Sugitani, Junichi; Taniguchi, Yasumaru; and Kaji, Tetsuo, 4,555,948, Cl. 73-640.000.

Sugiura, Katsuhiko, to Fuji Jukogyo Kabushiki Kaisha. System for controlling a carburetor of an internal combustion engine. 4,556,031, Cl. 123-437.000.

Sugiura, Yoji; Yamamoto, Hironori; Nishida, Keijiro; Shirai, Naoki; Takahashi, Kimio; Nakasugi, Mikio; and Saito, Norihisa, to Canon Kabushiki Kaisha. Reflection mirror for optical instrument. 4,556,285, Cl. 350-600.000.

Sugiyama, Takahiro, to Asahi Kogaku Kogyo Kabushiki Kaisha. Objective lens for use with information storage disks. 4,556,296, Cl. 350-475.000.

Suh, John T.; Skiles, Jerry W.; Piwinski, John J.; Menard, Paul; and Jones, Howard, to USV Pharmaceutical Corp. Antihypertensive spiro-amidoamino compounds. 4,556,652, Cl. 514-211.000.

Suisaku Kabushiki Kaisha: *See—*
Ogawa, Yonekichi, 4,556,485, Cl. 210-169.000.

Sullivan, Donald B.: *See—*
Thorley, Graham R.; and Sullivan, Donald B., 4,556,128, Cl. 187-9.00R.

Sullivan, Donald F. Transferring polymer from thin plastic films to photodevelop insulation patterns on printed wiring boards. 4,556,627, Cl. 430-312.000.

Sullivan, Thomas A.; and Witterholt, Vincent G., to Du Pont de Nemours, E. I., and Company. Process for the preparation of 2-hydroxybenzenesulfonamide. 4,556,733, Cl. 564-89.000.

Sulzer-Escher Wyss GmbH: *See—*
Dahl, Hans; Holik, Herbert; Kurtz, Rudiger; and Stotz, Wolf-Gunter, 4,556,454, Cl. 162-358.000.

Sumal, Jaihind S., to Robert Bosch GmbH. Method for measuring the flow rate of pulsating medium having a backflow. 4,555,937, Cl. 73-118.000.

Sumitomo Chemical Company, Limited: *See—*
Kawai, Kiyoshi; Kokubo, Toshiyuki; and Miyoshi, Yoshihiro, 4,556,648, Cl. 502-112.000.
Murakami, Yoshiaki; Shiba, Kunio; Yoshitake, Akira; Takahashi, Keietsu; Ueda, Nobuo; and Hazue, Masaaki, 4,556,689, Cl. 525-54.100.
Saita, Kenji; and Fujioka, Syozo, 4,556,501, Cl. 252-70.000.
Sunagawa, Makoto; Goda, Koshiro; Enomoto, Masao; and Sasaki, Akira, 4,556,514, Cl. 260-239.00A.

Sumitomo Electric Industries, Ltd.: *See—*
Kamijo, Eiji; and Higuchi, Matsuo, 4,556,416, Cl. 75-0.50B.
Nakai, Ryusuke, 4,556,784, Cl. 219-425.000.
Sato, Ken-ichi; Takano, Satoshi; and Miyazaki, Kenji, 4,556,609, Cl. 428-659.000.

Sumitomo Metal Industries, Ltd.: *See—*
Matsuda, Yukio; Tachibana, Kenzo; and Ueno, Tsutomu, 4,555,921, Cl. 72-224.000.

Sumitomo Rubber Industries, Ltd.: *See—*
Tominaga, Ichiro; and Nakahara, Akihiro, 4,556,220, Cl. 273-218.000.

Sumtak Corporation: *See—*
Kano, Takao; and Makino, Katsuhiko, 4,556,792, Cl. 250-231.0SE.

Sunagawa, Makoto; Goda, Koshiro; Enomoto, Masao; and Sasaki, Akira, to Sumitomo Chemical Company, Limited. 4-Carboxy azetidinone compounds and production thereof from diketene and a Schiff base. 4,556,514, Cl. 260-239.00A.

Sundstrand Corporation: *See—*
Burandt, Wesley A.; and Aldrich, Allyn M., 4,555,978, Cl. 91-506.000.
Chapman, John R., 4,556,131, Cl. 192-7.000.

Sundstrand Data Control, Inc.: *See*—
Hanson, Richard A.; and Foote, Steven A., 4,555,944, Cl. 73-517.00B.
Hanson, Richard A., 4,555,945, Cl. 73-517.00B.
Sunnen Products Company: *See*—
Sunnen, Robert M.; and Woltjen, Duane W., 4,555,875, Cl. 51-331.000.
Sunnen, Robert M.; and Woltjen, Duane W., to Sunnen Products Company. Means for attaching a replaceable stone and/or guide assembly to a master holder. 4,555,875, Cl. 51-331.000.
Supreme Automation Corporation: *See*—
Glater, Michael, 4,556,355, Cl. 414-280.000.
Suzue, Seigo: *See*—
Irikura, Tsutomu; Suzue, Seigo; and Okada, Kodo, 4,556,715, Cl. 546-322.000.
Suzuka, Kazuo: *See*—
Matsuoka, Hironao; and Suzuka, Kazuo, 4,556,989, Cl. 455-183.000.
Suzuki, Kazumasa: *See*—
Takazoe, Ichiro; Ohta, Kosei; Shimizu, Junichi; Suzuki, Kazumasa; Iwakura, Tatsuya; and Nakajima, Yoshikazu, 4,556,429, Cl. 127-30.000.
Suzuki, Minoru: *See*—
Horie, Motonobu; Suzuki, Minoru; and Ogura, Shinji, 4,556,072, Cl. 131-282.000.
Suzuki, Ryo: *See*—
Imura, Ryo; Ikeda, Tadashi; Takeuchi, Teruaki; Umezaki, Hiroshi; Suzuki, Ryo; and Sugita, Yutaka, 4,556,582, Cl. 427-38.000.
Suzuki, Syunsuke: *See*—
Oaku, Takaaki; Shioda, Masahiko; Suzuki, Syunsuke; and Maki, Yoshihiro, 4,556,533, Cl. 419-11.000.
Suzuki, Yoshiharu: *See*—
Fukagawa, Hitoshi; Suzuki, Yoshiharu; and Komoda, Yoshiyuki, 4,556,865, Cl. 340-310.00R.
Suzuki, Yoshihiro: *See*—
Kurihara, Yasutoshi; Suzuki, Yoshihiro; Ooue, Michio; Hachino, Hiroki; and Yanagi, Mitsuo, 4,556,899, Cl. 357-80.000.
Svensson, Hakan: *See*—
Persson, Bert; and Svensson, Hakan, 4,556,010, Cl. 116-22.00R.
Swain, Dwight P. Protective holder for binoculars. 4,556,159, Cl. 224-257.000.
Swanson, James L.; and Bendure, Raymond L., to Procter & Gamble Company, The. Individually packaged disposable absorbent article. 4,556,146, Cl. 206-440.000.
Swartz, William E.; Everson, Charles W.; and Bender, Fredric G., to Stauffer Chemical Company. Use of soy products having a reduced beany flavor in meat and other food products. 4,556,571, Cl. 426-265.000.
Sybron Corporation: *See*—
Pillis, Lewis J.; and Davis, Lois T., 4,556,638, Cl. 435-253.000.
Sychenkov, Vladimir V.: *See*—
Kalakutsky, Lev I.; Sychenkov, Vladimir V.; Vlasov, Vladimir B.; and Dubrovsky, Adolf V., deceased, 4,556,849, Cl. 324-464.000.
Syntex (U.S.A.) Inc.: *See*—
Verheyden, Julien P. H.; and Martin, John C., 4,556,659, Cl. 514-262.000.
Syska, Andrew J., to Thermal Systems Engineering, Inc. Process for melting a ferrous burden. 4,556,418, Cl. 75-43.000.
System-Finanz Aniagenberatungsgesellschaft m.b.H.: *See*—
Bajtala, Ladislav; and Puskin, Pavel (said Ladislav Bajtala assors. to), 4,556,154, Cl. 221-147.000.
Szajani, Bela: *See*—
Boross, Laszlo ; Szajani, Bela; and Kovacs, Kamilla, 4,556,637, Cl. 435-181.000.
Tabuchi, Kazuhiro: *See*—
Kaneki, Satoru; and Tabuchi, Kazuhiro, 4,556,608, Cl. 428-629.000.
Tachibana, Kenzo: *See*—
Matsuda, Yukio; Tachibana, Kenzo; and Ueno, Tsutomu, 4,555,921, Cl. 72-224.000.
Tachikawa Spring Co. Ltd.: *See*—
Takagi, Genziro, 4,556,185, Cl. 248-421.000.
Takagi, Genziro, 4,556,251, Cl. 297-284.000.
Tada, Tetsuya: *See*—
Kumagai, Naotake; Saga, Ikuo; Tatemoto, Minoru; and Tada, Tetsuya, 4,556,877, Cl. 340-713.000.
Tada, Yoshimitsu: *See*—
Matsushita, Susumu; Tada, Yoshimitsu; Ikushige, Tetsuo; and Baba, Nobuyuki, 4,556,538, Cl. 422-70.000.
Tada, Yukio: *See*—
Koda, Akihide; Hori, Mikio; Matsuura, Naosuke; Yasumoto, Mitsugi; Yamawaki, Ichiro; Ueda, Shuichi; and Tada, Yukio, 4,556,737, Cl. 564-218.000.
Tagoku, Izumi, to Ricoh Company, Ltd. Electrophotographic copying apparatus. 4,556,311, Cl. 355-14.00R.
Taguchi, Takashi: *See*—
Sato, Susumu; Hattori, Tadashi; Ueno, Yoshiki; and Taguchi, Takashi, 4,556,599, Cl. 428-216.000.
Tai, Anthony M.; and Aleksoff, Carl C., to Environmental Research Institute of Michigan. Incoherent optical processor. 4,556,950, Cl. 364-827.000.
Taiho Pharmaceutical Company Limited: *See*—
Koda, Akihide; Hori, Mikio; Matsuura, Naosuke; Yasumoto, Mitsugi; Yamawaki, Ichiro; Ueda, Shuichi; and Tada, Yukio, 4,556,737, Cl. 564-218.000.
Taira, Kazuo; Morofuji, Akihiko; Kobayashi, Seishichi; and Ueno, Hiroshi, to Toyo Seikan Kaisha Ltd. Metal vessel having circumferential side seam and adhesive primer for use in production thereof. 4,556,151, Cl. 220-67.000.
Takada, Nobuyuki: *See*—
Suganuma, Nobuo; Tanaka, Kensuke; Takada, Nobuyuki; and Ichikawa, Hiromichi, 4,556,553, Cl. 424-52.000.
Takagi, Genziro, to Tachikawa Spring Co. Ltd. Seat frame for a vehicle seat. 4,556,185, Cl. 248-421.000.
Takagi, Genziro, to Tachikawa Spring Co., Ltd. Lumbar support device. 4,556,251, Cl. 297-284.000.
Takagi, Hiroyoshi; Amaike, Toshiyuki; and Mizutani, Hikaru, to Hitachi Maxell Ltd. Magnetic recording tape cartridge. 4,556,153, Cl. 220-334.000.
Takahashi, Katsutoshi: *See*—
Umezawa, Hamao; Takeuchi, Tomio; Nishizawa, Rinzo; Takahashi, Katsutoshi; Nakamura, Teruya; and Umeda, Yoshihisa, 4,556,735, Cl. 564-157.000.
Takahashi, Keietsu: *See*—
Murakami, Yoshiaki; Shiba, Kunio; Yoshitake, Akira; Takahashi, Keietsu; Ueda, Nobuo; and Hazue, Masaaki, 4,556,689, Cl. 525-54.100.
Takahashi, Kimio: *See*—
Sugiura, Yoji; Yamamoto, Hironori; Nishida, Keijiro; Shirai, Naoki; Takahashi, Kimio; Nakasugi, Mikio; and Saito, Norihisa, 4,556,285, Cl. 350-600.000.
Takahashi, Kiyofumi: *See*—
Tomibe, Shinji; Gomibuchi, Reizo; and Takahashi, Kiyofumi, 4,556,507, Cl. 252-518.000.
Takahashi, Susumu: *See*—
Shishido, Yoshio; Nishigaki, Shinichi; Kato, Shinichi; Matsuo, Kazumasa; Miyazaki, Atsushi; Takahashi, Susumu; Nakamura, Takeaki; and Ishikawa, Akibumi, 4,556,787, Cl. 250-201.000.
Takahashi, Yoichi: *See*—
Ogata, Naoya; Sanui, Kohei; Azuma, Chiaki; Tanaka, Hozumi; Oguchi, Kiyoshi; Takahashi, Yoichi; and Nakada, Tomihiro, 4,556,619, Cl. 430-17.000.
Takahashi, Yutaka: *See*—
Sugawara, Norio; Nawa, Motoyuki; and Takahashi, Yutaka, 4,556,172, Cl. 239-590.500.
Takano, Satoshi: *See*—
Sato, Ken-ichi; Takano, Satoshi; and Miyazaki, Kenji, 4,556,609, Cl. 428-659.000.
Takano, Toshio, to Fuji Jukogyo Kabushiki Kaisha. Power transmission system for a four-wheel drive vehicle. 4,556,134, Cl. 192-103.00F.
Takara Kogyo Co., Ltd.: *See*—
Ueda, Yoshihiko, 4,556,487, Cl. 210-267.000.
Takasaki, Yukio: *See*—
Imamura, Yoshinori; Ataka, Saburo; Takasaki, Yukio; Tanaka, Yasuo; Hirai, Tadaaki; and Maruyama, Eiichi, 4,556,816, Cl. 313-366.000.
Kusano, Chushirou; Ishioka, Sachio; Imamura, Yoshinori; Takasaki, Yukio; Ogawa, Hirofumi; Makishima, Tatsuo; Hirai, Tadaaki; and Maruyama, Eiichi, 4,556,817, Cl. 313-371.000.
Takashi, Nishibe: *See*—
Shotaro, Yokoyama; and Takashi, Nishibe, 4,556,789, Cl. 250-206.000.
Takayanagi, Noriyasu: *See*—
Nishio, Kazuo; Chiyomaru, Isao; Anma, Katsuo; Yamamoto, Kazuko; Ohno, Hiroshi; and Takayanagi, Noriyasu, 4,556,669, Cl. 514-368.000.
Takazoe, Ichiro; Ohta, Kosei; Shimizu, Junichi; Suzuki, Kazumasa; Iwakura, Tatsuya; and Nakajima, Yoshikazu, to Mitsui Sugar Co., Ltd. Low-cariogenic sweeteners. 4,556,429, Cl. 127-30.000.
Takeda Chemical Industries, Ltd.: *See*—
Nishino, Hiroshi; Aibe, Toshio; and Noguchi, Katsuya, 4,556,547, Cl. 423-230.000.
Takegahara, Takashi: *See*—
Kishi, Hajimu; Seki, Masaki; Tanaka, Kunio; and Takegahara, Takashi, 4,556,833, Cl. 318-567.000.
Takei, Masahiro: *See*—
Maeda, Masaya; and Takei, Masahiro, 4,556,920, Cl. 360-77.000.
Takei, Masaki: *See*—
Matsushita, Yoshikazu; Takei, Masaki; Yonekubo, Masatoshi; and Nishiwaki, Tsutomu, 4,556,891, Cl. 346-76.0PH.
Takei, Narimichi: *See*—
Motoyama, Shimesu; Kurita, Kaora; Sakashita, Shizuka; Takei, Narimichi; and Ohno, Shigeru, 4,556,175, Cl. 241-57.000.
Takeuchi, Teruaki: *See*—
Imura, Ryo; Ikeda, Tadashi; Takeuchi, Teruaki; Umezaki, Hiroshi; Suzuki, Ryo; and Sugita, Yutaka, 4,556,582, Cl. 427-38.000.
Imura, Ryo; Ikeda, Tadashi; Takeuchi, Teruaki; Ohta, Norio; and Sugita, Yutaka, 4,556,583, Cl. 427-38.000.
Takeuchi, Tomio: *See*—
Umezawa, Hamao; Takeuchi, Tomio; Nishizawa, Rinzo; Takahashi, Katsutoshi; Nakamura, Teruya; and Umeda, Yoshihisa, 4,556,735, Cl. 564-157.000.
Takizawa, Satoshi: *See*—
Yamaguchi, Hiroshi; Sawamoto, Kunifumi; Sanbuichi, Hiroshi; Morita, Tatsuo; and Takizawa, Satoshi, 4,556,029, Cl. 123-41.150.
Talarico, Robert J.: *See*—
Dornes, Bryan J.; and Talarico, Robert J., 4,555,847, Cl. 29-739.000.
Tamagawa, Akira: *See*—
Kano, Tokio; and Tamagawa, Akira, 4,556,641, Cl. 436-165.000.
Tamura, Manabu: *See*—
Kondo, Tatsuo; Tamura, Manabu; Tanimura, Masayuki; and Kamemura, Yoshiki, 4,556,423, Cl. 75-125.000.

Tamura, Shohei; Sasaki, Sadamitsu; Sasaki, Takeshi; Ichinose, Hisashi; Nakamoto, Keiji; Abe, Masao; and Nakazawa, Hitoshi, to Nitto Electric Industrial Co., Ltd. Electroconductive porous film and process for producing same. 4,556,623, Cl. 430-83.000.

Tanabe, Toshio: *See—*
Ando, Hiroyuki; Tanabe, Toshio; and Ihara, Shinji, 4,555,849, Cl. 30-388.000.

Tanaka, Hozumi: *See—*
Ogata, Naoya; Sanui, Kohei; Azuma, Chiaki; Tanaka, Hozumi; Oguchi, Kiyoshi; Takahashi, Yoichi; and Nakada, Tomihiro, 4,556,619, Cl. 430-17.000.

Tanaka, Kazuyuki, to Matsushita Electric Industrial Co., Ltd. Video display apparatus. 4,556,879, Cl. 340-750.000.

Tanaka, Kensuke: *See—*
Suganuma, Nobuo; Tanaka, Kensuke; Takada, Nobuyuki; and Ichikawa, Hiromichi, 4,556,553, Cl. 424-52.000.

Tanaka, Kentaro; and Tsuji, Naoki, to Shionogi & Co., Ltd. Carbapenem derivatives. 4,556,517, Cl. 260-245.20T.

Tanaka, Kunio: *See—*
Kishi, Hajimu; Seki, Masaki; Tanaka, Kunio; and Takegahara, Takashi, 4,556,833, Cl. 318-567.000.

Tanaka, Masanori, to Hosiden Electronics Co., Ltd. Telephone connector. 4,556,264, Cl. 339-17.0LC.

Tanaka, Shigenori; and Tomia, Kouji, to Nissan Motor Co., Ltd. Control arrangement for weaving loom or the like. 4,556,088, Cl. 139-452.000.

Tanaka, Shigeru: *See—*
Nogi, Hiroyoshi; and Tanaka, Shigeru, 4,556,212, Cl. 271-315.000.

Tanaka, Yasuo: *See—*
Imamura, Yoshinori; Ataka, Saburo; Takasaki, Yukio; Tanaka, Yasuo; Hirai, Tadaaki; and Maruyama, Eiichi, 4,556,816, Cl. 313-366.000.

Tanaka, Yukio; and Chigodo, Yoshikazu, to Murata Manufacturing Co. Ltd. Multi-layer ceramic capacitor. 4,556,929, Cl. 361-321.000.

Tancs, Tibor L., to Singer Company, The. Semi-automatic sewing machine control system. 4,555,997, Cl. 112-121.110.

Tanemura, Hatsumi; Ukai, Toshinao; Okazaki, Masaki; Deguchi, Naoyasu; Fujita, Munehisa; and Yamamuro, Kiyohiko, to Fuji Photo Film Co., Ltd. Silver halide color light-sensitive materials. 4,556,633, Cl. 430-573.000.

Taniguchi, Yasumaru: *See—*
Miyamoto, Hirofumi; Kaitatsu, Nobuaki; Sugitani, Junichi; Taniguchi, Yasumaru; and Kaji, Tetsuo, 4,555,948, Cl. 73-640.000.

Taniguti, Ryosuki, to Mitsubishi Denki Kabushiki Kaisha. Ground detection arrangement for A.C. generator. 4,556,946, Cl. 364-481.000.

Tanimoto, Sigemi: *See—*
Otsuka; Ryotatsu; Tanimoto, Sigemi; and Toyoda, Kazuo, 4,556,419, Cl. 75-68.00R.

Tanimura, Masayuki: *See—*
Kondo, Tatsuo; Tamura, Manabu; Tanimura, Masayuki; and Kamemura, Yoshiki, 4,556,423, Cl. 75-125.000.

Taniuchi, Masahiko: *See—*
Misaki, Hideo; and Taniuchi, Masahiko, 4,556,634, Cl. 435-25.000.

Tannahill, Clifton A., to Union Oil Company of California. Method of fabricating a broad-based submersible structure. 4,556,342, Cl. 405-203.000.

Taprogge Gesellschaft mbH: *See—*
Bochinski, Rolf; Eimer, Klaus; Lange, Alois; and Nghiem, Xuan L., 4,556,102, Cl. 165-95.000.

Tar Heel Technologies, Inc.: *See—*
Fahey, Dennis M., 4,556,338, Cl. 404-28.000.

Tarbox, Inc.: *See—*
Tarbox, Max R.; and Rosales, Nancy, 4,556,215, Cl. 272-119.000.

Tarbox, Max R.; and Rosales, Nancy, to Tarbox, Inc. Hand exercise weights. 4,556,215, Cl. 272-119.000.

Tardivel, Georges M.; and Tardivel, Monique M. Inflatable ship interior simulating play tent. 4,556,391, Cl. 446-7.000.

Tardivel, Monique M.: *See—*
Tardivel, Georges M.; and Tardivel, Monique M., 4,556,391, Cl. 446-7.000.

Tarr, Henry, to Auto-Tint, Inc. Multicolor tinter tank system. 4,556,011, Cl. 118-46.000.

Tasaka, Mitsuyuki: *See—*
Ueno, Masato; Sato, Masayoshi; Tasaka, Mitsuyuki; and Naito, Tatsuro, 4,556,389, Cl. 433-206.000.

Tatemoto, Minoru: *See—*
Kumagai, Naotake; Saga, Ikuo; Tatemoto, Minoru; and Tada, Tetsuya, 4,556,877, Cl. 340-713.000.

Tatsukawa, Sachiko: *See—*
Izawa, Masao; and Tatsukawa, Sachiko, 4,556,639, Cl. 435-284.000.

Taylor, Alwyn H.; Lees, Wayne L.; and Cook, Michael L., to Duracell Inc. Resistant glass in glass-metal seal and cell terminal structure for lithium electrochemical cells. 4,556,613, Cl. 429-101.000.

Taylor, Chandler R., Jr., to A. H. Robins Company, Incorporated. Aryl substituted pyrido[1,4]benzodiazepines and their use as antidepressives. 4,556,667, Cl. 514-352.000.

Tazima, Yoshihisa; Morishima, Masayuki; Okumura, Hiroshi; and Kasahara, Shin-ichi, to Sanyo Electric Co., Ltd.; and Tokyo Sanyo Electric Co., Ltd. Induction heating cooking apparatus. 4,556,770, Cl. 219-10.49R.

Tchernev, Dimiter I. Integrated solar collector. 4,556,049, Cl. 126-429.000.

TELDIX GmbH: *See—*
Kranz, Jakob; Kaiser, Joachim; Wiegemann, Hans-Bertram; and Baron, Klaus U., 4,556,320, Cl. 356-350.000.

Teledyne Industries, Inc.: *See—*
Hunter, Charles L.; Fuller, Payton D.; and Mutchler, David K., 4,556,484, Cl. 210-90.000.

Telefonaktiebolaget LM Ericsson: *See—*
Andersson, Folke O. A.; and Larsson, Hakan A., 4,556,269, Cl. 339-75.00M.
Thyni, Thomas, 4,556,971, Cl. 370-58.000.

Terasawa, Koji, to Canon Kabushiki Kaisha. Ink-jet type printer and a function restoration suction device. 4,556,894, Cl. 346-140.00R.

Terumo Kabushiki Kaisha: *See—*
Kobayashi, Susumu; Muramoto, Yutaka; Ishizaka, Hideo; and Ishii, Yoshinori, 4,556,837, Cl. 320-2.000

Teshima, Toru: *See—*
Uchida, Tatsu; Teshima, Toru; Wada, Masanobu, deceased; Wada, Masami, heir; and Makuta, Yuri, heiress, 4,556,286, Cl. 350-335.000.

Tessier, Jean; Demoute, Jean-Pierre; and Cadiergue, Joseph, to Roussel Uclaf. Cyclopropane carboxylic acid derivatives. 4,556,666, Cl. 514-351.000.

Tessier, Jean: *See—*
Martel, Jacques; Tessier, Jean; and Demoute, Jean-Pierre, 4,556,732, Cl. 562-577.000.

Texaco Inc.: *See—*
Knifton, John F., 4,556,734, Cl. 564-132.000.
Sanderson, John R.; Nieh, Edward C. Y.; and Watts, Lewis W., Jr., 4,556,730, Cl. 560-256.000.
Sayles, Scott M.; and Castagnos, Leonce F., Jr., 4,556,542, Cl. 422-147.000.

Texas Instruments Incorporated: *See—*
Amin, Pravin T., 4,556,806, Cl. 307-475.000.
Coats, Robert P., 4,556,808, Cl. 307-571.000.
Malhi, Satwinder D. S., 4,555,843, Cl. 29-571.000.
Senor, Ronald E., 4,556,267, Cl. 339-59.00M.

Texas Recreation Corporation: *See—*
Hancock, Kendal, 4,556,375, Cl. 425-127.000.

Theodor Hymmen KG, Firma: *See—*
Pankoke, Werner, 4,555,988, Cl. 100-154.000.

Thermal Systems Engineering, Inc.: *See—*
Syska, Andrew J., 4,556,418, Cl. 75-43.000.

Theurer, Josef; and Brunninger, Manfred, to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H. Mobile conveyor arrangement. 4,556,112, Cl. 171-16.000.

Thibault, William C.; and Fowler, Robert C., to General Electric Company. Resealable vent valve for a rechargeable battery. 4,556,612, Cl. 429-54.000.

Thomas & Betts Corporation: *See—*
Sonobe, Toshimitsu, 4,556,266, Cl. 339-29.00R.

Thomas, Calvin J., to Raytheon Company. Microwave feed for common cavity oven. 4,556,771, Cl. 219-10.55F.

Thomas, Christopher L., to Intergraph Corporation. Switching circuit. 4,556,825, Cl. 315-408.000.

Thomassen & Drijver-Verblifa N.V.: *See—*
Dijkman, Berend J., 4,555,892, Cl. 53-142.000.

Thompson, Clifford F.; and Thompson, Lawrence F., to Cliffside Pipelayers. Clamping apparatus for plastic pipe. 4,556,207, Cl. 269-41.000.

Thompson, David L.; Bennett, Robert M.; and Roline, Glenn M., to Medtronic, Inc. Telemetry system for a medical device. 4,556,063, Cl. 128-419.0PT.

Thompson, Hugh A.: *See—*
Chuang, Strong C.; and Thompson, Hugh A., 4,556,450, Cl. 162-204.000.

Thompson, Lawrence F.: *See—*
Thompson, Clifford F.; and Thompson, Lawrence F., 4,556,207, Cl. 269-41.000.

Thompson, Richard J.: *See—*
Hoffmeister, Lawrence D.; and Thompson, Richard J., 4,556,438, Cl. 156-79.000.

Thompson, Robert P., to RCA Corporation. Image display including a light-absorbing matrix of zinc-iron sulfide and method of preparation. 4,556,620, Cl. 430-25.000.

Thompson, Robert P., to RCA Corporation. Image display including a light-absorbing matrix of zinc-iron sulfide. 4,556,820, Cl. 313-470.000.

Thompson, Thomas W., to Sanders Associates, Inc. Electric motor adapted to permit translational motion between field and armature. 4,556,828, Cl. 318-254.000.

Thomson-CSF: *See—*
Bricot, Claude; Berthet, Pierre; Mertz, Bruno; and Gerard, Jean-Louis, 4,556,966, Cl. 369-52.000.

Thomson, David J., to AT&T Bell Laboratories. Multi-function data signal processing method and apparatus. 4,556,869, Cl. 340-347.0DD.

Thorley, Graham R.; and Sullivan, Donald B., to Lift-U-Inc. Wheelchair lift. 4,556,128, Cl. 187-9.00R.

Thorn EMI Domestic Appliances Limited: *See—*
Frost, Kenneth S.; Halberstadt, Alex L.; and Letchford, John A., 4,556,786, Cl. 219-464.000.

Thornton, Raymond A.: *See—*
Allen, Wade H.; Cory, Theodore M.; and Thornton, Raymond A., 4,556,959, Cl. 364-900.000.

Thorsrud, Agmund K., to Phillips Petroleum Company. Method of making lightweight thermoplastic elastomer and product thereof. 4,556,603, Cl. 428-283.000.

Thurber, Scott W., to Air Products and Chemicals, Inc. Method of interference-fitting male and female members. 4,555,839, Cl. 29-450.000.

Thyni, Thomas, to Telefonaktiebolaget LM Ericsson. Apparatus for loading memories in a telecommunication exchange. 4,556,971, Cl. 370-58.000.

Tiddy, Gordon J. T.: *See—*
Blackmore, Eunice S.; Peterson, Gordon C.; and Tiddy, Gordon J. T., 4,556,502, Cl. 252-8.800.

Tietje, Andreas, to Ensign-Bickford Industries, Inc. Corona discharge device. 4,556,795, Cl. 250-324.000.

Tile Council of America, Inc.: *See—*
Chesney, Joseph J., Jr.; Broney, Scott C.; and Ely, George A., 4,556,426, Cl. 106-18.320.

Tillery, Thomas H. Golf practice cage. 4,556,219, Cl. 273-181.00F.

Timari, Jali. Automatic hand firearm operating and safety handle. 4,555,973, Cl. 89-148.000.

Timm, Hans; and Griesbach, Heinz, to GKSS-Forschungszentrum Geesthacht GmbH. Apparatus for filtering and separating liquid and gaseous media. 4,556,488, Cl. 210-321.100.

Timony, Peter E.: *See—*
Leone-Bay, Andrea; and Timony, Peter E., 4,556,412, Cl. 71-92.000.

Tippins Machinery Company, Inc.: *See—*
Ginzburg, Vladimir B., 4,555,922, Cl. 72-229.000.

Tisue, Gil, to Fuji Photo Film Co., Ltd. Image sensing device having on-chip fixed-pattern noise reducing circuit. 4,556,910, Cl. 358-212.000.

Tobia, Alfonso J.: *See—*
Kanojia, Ramesh M.; Bandurco, Victor T.; Levine, Seymour D.; Mulvey, Dennis M.; and Tobia, Alfonso J., 4,556,739, Cl. 564-443.000.

Tobias, Russell H.; and Hutchings, David A., to Owens-Corning Fiberglas Corporation. Conductive polymers. 4,556,860, Cl. 338-22.0SD.

Todtenhaupt, Dieter: *See—*
Meuer, Johannes; Nemack, Christian; and Todtenhaupt, Dieter, 4,556,766, Cl. 200-81.90R.

Toivola, Reijo J.: *See—*
Sodervall, Marja-Liisa; Kurkela, Kauko O. A.; Karjalainen, Arto J.; Toivola, Reijo J.; Kangas, Lauri V. M.; and Blanco, Guillermo L., 4,556,677, Cl. 514-651.000.

Tokai Electric Wire Company Limited: *See—*
Ito, Katsuya, 4,556,226, Cl. 277-207.00A.

Tokyo Electric Co., Ltd.: *See—*
Maekawa, Motoi, 4,556,332, Cl. 400-3.000.

Tokyo Gas Co., Ltd.: *See—*
Kamuro, Takashi; Ootsuga, Hisao; Saito, Isao; and Koga, Motoyuki, 4,556,580, Cl. 427-8.000.

Tokyo Sanyo Electric Co., Ltd.: *See—*
Tazima, Yoshihisa; Morishima, Masayuki; Okumura, Hiroshi; and Kasahara, Shin-ichi, 4,556,770, Cl. 219-10.49R.

Tokyo Shibaura Denki Kabushiki Kaisha: *See—*
Iwahashi, Hiroshi; and Asano, Masamichi, 4,556,961, Cl. 365-194.000.
Kurosawa, Ryoichi, 4,556,885, Cl. 340-870.250.
Tsubo, Shuzo, 4,556,209, Cl. 271-10.000.
Yamashita, Kiyoshi, 4,555,984, Cl. 99-286.000.

Tomia, Kouji: *See—*
Tanaka, Shigenori; and Tomia, Kouji, 4,556,088, Cl. 139-452.000.

Tomibe, Shinji; Gomibuchi, Reizo; and Takahashi, Kiyofumi, to Nihon Sanmo Dyeing Co., Ltd. Electrically conducting material and method of preparing same. 4,556,507, Cl. 252-518.000.

Tomibe, Shinji; and Murasaki, Norio, to Nihon Sanmo Dyeing Co., Ltd. Electrically conducting material and process of preparing same. 4,556,508, Cl. 252-518.000.

Tominaga, Hiroshi, to Fuji Electric Co., Ltd. Height adjusting lifter for hospital bed. 4,556,198, Cl. 254-122.000.

Tominaga, Ichiro; and Nakahara, Akihiro, to Sumitomo Rubber Industries, Ltd. Solid golf balls. 4,556,220, Cl. 273-218.000.

Tonon, Giancarlo: *See—*
Giani, Roberto; Parini, Ettore; and Tonon, Giancarlo, 4,556,653, Cl. 514-220.000.

Toraason, Clifford M., Jr.: *See—*
Sargisson, Donald F.; and Toraason, Clifford M., Jr., 4,556,366, Cl. 416-155.000.

Torbeck, Daniel J., to Monarch Marking Systems, Inc. Hand-held electrically selectable labeler. 4,556,442, Cl. 156-350.000.

Torbov, Tsvetan I.; Offen, George R.; and Denike, Stuart K., to Acurex Corp. Method for reduction of sulfur products in the exhaust gases of a combustion chamber. 4,555,996, Cl. 110-345.000.

Torre, Francesco. Machine for packaging products in heat-shrinkable film. 4,555,895, Cl. 53-557.000.

Torremans, Joseph L. G.: *See—*
Janssens, Frans E.; Torremans, Joseph L. G.; Hens, Jozef F.; and Van Offenwert, Theophilus T. J. M., 4,556,660, Cl. 514-272.000.

Toshiba Ceramics Co., Ltd.: *See—*
Yamura, Hitoo; Ikeda, Kakuro; and Sakai, Yuhichi, 4,556,202, Cl. 266-242.000.

Total Engineering and Research Company: *See—*
Mauleon, Jean-Louis; Newman, Robert J.; and Black, Alan J., 4,556,479, Cl. 208-164.000.

Toyo Jozo Kabushiki Kaisha: *See—*
Misaki, Hideo; and Taniuchi, Masahiko, 4,556,634, Cl. 435-25.000.
Nishio, Kazuo; Chiyomaru, Isao; Anma, Katsuo; Yamamoto, Kazuko; Ohno, Hiroshi; and Takayanagi, Noriyasu, 4,556,669, Cl. 514-368.000.

Toyo Seikan Kaisha Ltd.: *See—*
Taira, Kazuo; Morofuji, Akihiko; Kobayashi, Seishichi; and Ueno, Hiroshi, 4,556,151, Cl. 220-67.000.
Tsurumaru, Michiko; Nakazato, Seiichi; Nunokawa, Atsushi; Ueno, Hiroshi; and Kobayashi, Seishichi, 4,556,354, Cl. 413-15.000.

Toyo Soda Manufacturing Co., Inc.: *See—*
Matsushita, Susumu; Tada, Yoshimitsu; Ikushige, Tetsuo; and Baba, Nobuyuki, 4,556,538, Cl. 422-70.000.

Toyo Stauffer Chemical Co., Ltd.: *See—*
Yamamoto, Hisashi, 4,556,515, Cl. 260-239.00B.

Toyoda, Kazuo: *See—*
Otsuka, Ryotatsu; Tanimoto, Sigemi; and Toyoda, Kazuo, 4,556,419, Cl. 75-68.00R.

Toyota Jidosha Kabushiki Kaisha: *See—*
Aoki, Keiji; and Ikeda, Shinji, 4,556,035, Cl. 123-488.000.
Ito, Toshimitsu; and Kobayashi, Nobuyuki, 4,556,033, Cl. 123-440.000.

Toyota Jidosha Kogyo Kabushiki Kaisha: *See—*
Ikumi, Yasumasa, 4,556,150, Cl. 220-4.00B.

Toyota, Koji: *See—*
Yamada, Takemi; Satoh, Tamataro; Mizushina, Masaaki; Toyota, Koji; and Okamoto, Hiromi, 4,556,022, Cl. 123-188.0AA.

Toyota Motor Corporation: *See—*
Naruse, Kazuo; Yokoi, Koji; and Kurokawa, Yoshiaki, 4,556,783, Cl. 219-388.000.

Trak-Tech, Inc.: *See—*
Doorley, Richard B.; Henninger, Paul J.; Klages, Chester F., Jr.; and Shetter, Jerrold K., 4,556,127, Cl. 184-3.100.

Tres Design Co., Inc.: *See—*
Geneve, Francois M.; Heiligenstein, Luc M. D.; and Melamed, Stephen B., 4,556,253, Cl. 297-440.000.

Treseder, Robert C.; and Savarese, Thomas G., to International Business Machines Corporation. Hermetically sealed disk file. 4,556,969, Cl. 369-291.000.

Trethewey, Paul M., to Burroughs Corporation. Technique for monitoring galvo angle. 4,556,964, Cl. 369-44.000.

Tringali, Mario, to Coten S.r.l. Structural element for constructions. 4,555,878, Cl. 52-81.000.

Trinity Industrial Corporation: *See—*
Naruse, Kazuo; Yokoi, Koji; and Kurokawa, Yoshiaki, 4,556,783, Cl. 219-388.000.

Trumpf GmbH & Co.: *See—*
Klingel, Hans, 4,555,966, Cl. 83-71.000.

Trumpp, Hans J.: *See—*
Greschner, Johann; Schwerdt, Friedrich W.; and Trumpp, Hans J., 4,556,628, Cl. 430-314.000.

Trussler, Ronald C.; Stevenson, Andrew C.; and Eastcott, Peter D., to Canadian General Electric Company Limited. Inching supply torque control. 4,556,826, Cl. 318-92.000.

Tsang, Albert C.; Holland, Thomas L.; and Masey, Johnny W., to Dow Chemical Company, The. Process for producing alkylene glycols. 4,556,748, Cl. 568-858.000.

Tsiamis, Chris; and McCaskie, John E., to LeaRonal, Inc. Process for electro-magnetic interference shielding. 4,556,587, Cl. 427-304.000.

Tsubo, Shuzo, to Tokyo Shibaura Denki Kabushiki Kaisha. Sheet feeding apparatus. 4,556,209, Cl. 271-10.000.

Tsuboi, Shinichi: *See—*
Saito, Junichi; Kudamatsu, Akio; Kume, Toyohiko; and Tsuboi, Shinichi, 4,556,650, Cl. 514-128.000.

Tsubouchi, Toshiyuki; and Hata, Hitoshi, to Idemitsu Kosan Company Limited. Traction drive fluids. 4,556,503, Cl. 252-73.000.

Tsuchihashi, Akira: *See—*
Sarugaku, Shinichi; Tsuchihashi, Akira; and Tsuji, Masao, 4,556,777, Cl. 219-124.340.

Tsuchiya, Yutaka: *See—*
Hiruma, Teruo; Honma, Atsushi; Hirano, Tooru; Tsuchiya, Yutaka; Hayata, Yoshihiro; Aizawa, Katsuo; Kato, Harubumi; and Kainuma, Keiji, 4,556,057, Cl. 128-303.100.

Tsuji, Masao: *See—*
Sarugaku, Shinichi; Tsuchihashi, Akira; and Tsuji, Masao, 4,556,777, Cl. 219-124.340.

Tsuji, Naoki: *See—*
Tanaka, Kentaro; and Tsuji, Naoki, 4,556,517, Cl. 260-245.20T.

Tsujino, Masahide: *See—*
Saito, Taro; Umeki, Kazumi; Ohno, Takaaki; Sakane, Hirobumi; Tsujino, Masahide; Sanpei, Keiichi; Nagamine, Yoshibumi; and Sato, Yoshitaka, 4,556,113, Cl. 172-91.000.

Tsukada, Norishige: *See—*
Yamazaki, Taro; Okamoto, Masashi; Iizuka, Tokio; Tsukada, Norishige; and Okamori, Kenji, 4,556,918, Cl. 358-283.000.

Tsukada, Toshihisa: *See—*
Ohta, Hisao; Baji, Toru; Izawa, Yuji; Ebisui, Eizou; Tsukada, Toshihisa; and Yamamoto, Hideaki, 4,556,800, Cl. 250-578.000.

Tsuneoka, Akira: *See—*
Yamamoto, Toshiki; Kiriu, Yukio; Tsuneoka, Akira; and Sudo, Kunikane, 4,556,099, Cl. 164-451.000.

Tsunoda, Yoshito; Miyauchi, Toshimitsu; and Shigematsu, Kazuo, to Hitachi, Ltd. Information recording apparatus having automatic focusing. 4,556,965, Cl. 369-45.000.

Tsurumaru, Michiko; Nakazato, Seiichi; Nunokawa, Atsushi; Ueno, Hiroshi; and Kobayashi, Seishichi, to Toyo Seikan Kaisha, Ltd. Process for production of bonded can of key-opening type. 4,556,354, Cl. 413-15.000.

Tubridy, Michael F.: *See—*
Stewart, Donald F.; Tubridy, Michael F.; and Huthwaite, Herbert J., 4,556,696, Cl. 525-432.000.

Tumlinson, Larry N. Method and apparatus for extraction of aloe vera gel. 4,555,987, Cl. 100-118.000.

Turner, Robert M. Handrail for toddlers. 4,556,201, Cl. 256-59.000.

Turner, Scot: *See*—
Quirk, Jennifer M.; and Turner, Scot, 4,556,722, Cl. 556-413.000.
Twentse Graveerindustrie B.V.: *See*—
van Heuvelen, Jan H., 4,556,610, Cl. 428-666.000.
Tydd, Christopher B.: *See*—
Couch, Alan T.; Cruickshank, Terence D.; Davey, William L. E.; Marshall, Anthony R.; Tydd, Christopher B.; and Wakeford, David R., 4,556,017, Cl. 122-4.00D.
Tynan, Daniel G., to Du Pont de Nemours, E. I., and Company. Apparatus for forming films of constant thickness. 4,556,324, Cl. 366-85.000.
Tyrell, John A.: *See*—
McCready, Russell J.; and Tyrell, John A., 4,556,688, Cl. 525-33.000.
Tysoe, Nicholas W., to Britax Vega Limited. Vehicle lamp assembly. 4,556,928, Cl. 362-268.000.
Tyson, Neil W.: *See*—
Riley, James E.; and Tyson, Neil W., 4,556,082, Cl. 137-375.000.
UBE Industries, Ltd.: *See*—
Yajima, Seishi; Okamura, Kiyohito; Hasegawa, Yoshio; and Yamamura, Takemi, 4,556,526, Cl. 264-60.000.
Uchida, Tatsu; Teshima, Toru; Wada, Masanobu, deceased (by Wada, Eiko, heiress); Wada, Masami, heir; and Makuta, Yuri, heiress, to Stanley Electric Co., Ltd. Multilayer guest host liquid crystal display without polarizers. 4,556,286, Cl. 350-335.000.
Ueda, Nobuo: *See*—
Murakami, Yoshiaki; Shiba, Kunio; Yoshitake, Akira; Takahashi, Keietsu; Ueda, Nobuo; and Hazue, Masaaki, 4,556,689, Cl. 525-54.100.
Ueda, Shuichi: *See*—
Koda, Akihide; Hori, Mikio; Matsuura, Naosuke; Yasumoto, Mitsugi; Yamawaki, Ichiro; Ueda, Shuichi; and Tada, Yukio, 4,556,737, Cl. 564-218.000.
Ueda, Yoshihiko, to Takara Kogyo Co., Ltd. Water filtering device. 4,556,487, Cl. 210-267.000.
Uemura, Hiroki, to Pioneer Electronic Corp. Frequency-division multiplex communication method and system. 4,556,973, Cl. 370-69.100.
Ueno, Hiroshi: *See*—
Taira, Kazuo; Morofuji, Akihiko; Kobayashi, Seishichi; and Ueno, Hiroshi, 4,556,151, Cl. 220-67.000.
Tsurumaru, Michiko; Nakazato, Seiichi; Nunokawa, Atsushi; Ueno, Hiroshi; and Kobayashi, Seishichi, 4,556,354, Cl. 413-15.000.
Ueno, Masato; Sato, Masayoshi; Tasaka, Mitsuyuki; and Naito, Tatsuro, to Four Brain Company Ltd.; and Kyoto Ceramic Company Ltd. Method and compositions for bonding metals and ceramics with which to make prosthetic teeth. 4,556,389, Cl. 433-206.000.
Ueno, Tsutómu: *See*—
Matsuda, Yukio; Tachibana, Kenzo; and Ueno, Tsutomu, 4,555,921, Cl. 72-224.000.
Ueno, Yoshiki: *See*—
Sato, Susumu; Hattori, Tadashi; Ueno, Yoshiki; and Taguchi, Takashi, 4,556,599, Cl. 428-216.000.
Ueyama, Katsuyoshi: *See*—
Oishibashi, Hirotsugu; Ueyama, Katsuyoshi; Ohara, Muneyuki; Nakamura, Mitsuo; Aichi, Takeo; and Sasaki, Shigeru, 4,556,164, Cl. 228-199.000.
Ugon, Michel, to Compagnie International pour l'Informatique Cii-Honeywell Bull (Societe Anonyme). Device for single line bidirectional data transmission between an intelligent card's microprocessor and a second processor. 4,556,958, Cl. 364-200.000.
Ukai, Toshinao: *See*—
Tanemura, Hatsumi; Ukai, Toshinao; Okazaki, Masaki; Deguchi, Naoyasu; Fujita, Munehisa; and Yamamuro, Kiyohiko, 4,556,633, Cl. 430-573.000.
Ukigai, Toshiyuki: *See*—
Morita, Hiroshi; Kawada, Yasuyuki; Yamada, Junichi; and Ukigai, Toshiyuki, 4,556,108, Cl. 166-274.000.
Umeda, Yoshihisa: *See*—
Umezawa, Hamao; Takeuchi, Tomio; Nishizawa, Rinzo; Takahashi, Katsutoshi; Nakamura, Teruya; and Umeda, Yoshihisa, 4,556,735, Cl. 564-157.000.
Umeha, Genkichi; Urano, Shigeru; and Kato, Satoru, to Nippon Piston Ring Co., Ltd. Method for manufacturing camshaft. 4,556,532, Cl. 419-5.000.
Umeki, Kazumi: *See*—
Saito, Taro; Umeki, Kazumi; Ohno, Takaaki; Sakane, Hirobumi; Tsujino, Masahide; Sanpei, Keiichi; Nagamine, Yoshibumi; and Sato, Yoshitaka, 4,556,113, Cl. 172-91.000.
Umezaki, Hiroshi: *See*—
Imura, Ryo; Ikeda, Tadashi; Takeuchi, Teruaki; Umezaki, Hiroshi; Suzuki, Ryo; and Sugita, Yutaka, 4,556,582, Cl. 427-38.000.
Umezawa, Hamao; Takeuchi, Tomio; Nishizawa, Rinzo; Takahashi, Katsutoshi; Nakamura, Teruya; and Umeda, Yoshihisa, to Zaidan Hojin Biseibutsu Kagaku Kenkyukai. Spergualin-related compounds having a phenylene group as well as a process for producing the same. 4,556,735, Cl. 564-157.000.
Uni-Cardan Aktiengesellschaft: *See*—
Krude, Werner; Muller, Karl-Heinz; and Welschof, Hans-Heinrich, 4,556,400, Cl. 464-181.000.
Union Camp Corporation: *See*—
Lewis, Harry D., 4,556,427, Cl. 106-20.000.
Union Carbide Corporation: *See*—
Corcoran, Richard J.; Kopf, Peter W.; and Smith, Donald F., Jr., 4,556,693, Cl. 525-162.000.
Coughlin, Peter K.; and Rabo, Jule A., 4,556,645, Cl. 502-66.000.
Kanner, Bernard; Quirk, Jennifer M.; De Monte, Arthur P.; and Hopper, Steven P., 4,556,725, Cl. 556-442.000.
Quirk, Jennifer M.; and Turner, Scot, 4,556,722, Cl. 556-413.000.
Reedy, James D.; and Walsh, John J., 4,556,726, Cl. 556-460.000.
Ross, Ronald J.; and Sherman, John D., 4,556,550, Cl. 423-328.000.
Union Oil Company of California: *See*—
Deering, Roland F.; Hines, John E.; and Dhondt, Roland O., deceased, 4,556,458, Cl. 202-227.000.
Tannahill, Clifton A., 4,556,342, Cl. 405-203.000.
United Kingdom Atomic Energy Authority: *See*—
Bannister, Dennis J., 4,556,615, Cl. 429-192.000.
United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the: *See*—
Carr, Neil; and Gray, George W., 4,556,745, Cl. 568-632.000.
Cullis, Anthony G.; Webber, Hugh C.; and Chew, Nigel G., 4,556,524, Cl. 264-1.200.
U.S. Industries, Inc.: *See*—
Osborn, Denis L., 4,556,015, Cl. 119-56.00R.
United States Manufacturing Company: *See*—
Irons, George P., 4,556,053, Cl. 128-80.00C.
United States of America
Agriculture: *See*—
Robertson, George H.; and Pavlath, Attila E., 4,556,460, Cl. 203-19.000.
Army: *See*—
Hoffmeister, Lawrence D.; and Thompson, Richard J., 4,556,438, Cl. 156-79.000.
Miller, Walter E., Jr.; Westrich, Richard G., Jr.; and Jones, Michael M., 4,556,313, Cl. 356-1.000.
Energy: *See*—
Eberhard, Philippe H., 4,556,848, Cl. 324-309.000.
Kline, Gerald R.; and Lakin, Kenneth M., 4,556,812, Cl. 310-324.000.
Vartsky, David; Wielopolski, Lucian; LoMonte, Anthony F.; Ellis, Kenneth J.; and Cohn, Stanton H., 4,556,068, Cl. 128-719.000.
Health and Human Services: *See*—
Rice, Kenner C., 4,556,712, Cl. 546-149.000.
National Aeronautics and Space Administration: *See*—
Craig, Glenn D., 4,556,986, Cl. 382-42.000.
Kalil, Lou F.; and Reinhardt, Victor, 4,556,327, Cl. 374-115.000.
Navy: *See*—
Addamiano, Arrigo, 4,556,436, Cl. 148-175.000.
Burns, William K.; and Moeller, Robert P., 4,556,293, Cl. 350-400.000.
Chiang, Bing; and Sheleg, Boris, 4,556,855, Cl. 333-113.000.
Hugus, George D.; and Young, A. Mark, 4,556,963, Cl. 367-143.000.
U.S. Philips Corporation: *See*—
Braat, Josephus J. M., 4,556,967, Cl. 369-275.000.
Erhart, Georg, 4,556,922, Cl. 360-85.000.
Hasler, Rudolf, 4,556,990, Cl. 455-333.000.
Renals, Martin, 4,556,796, Cl. 250-338.000.
Schlosser, Theodoor A. J.; and Smakman, Theodorus H., 4,556,987, Cl. 455-161.000.
United States Riley Corporation: *See*—
Bagby, Robert J., 4,556,280, Cl. 350-96.160.
United States Surgical Corporation: *See*—
Green, David T., 4,556,058, Cl. 128-305.000.
United Technologies Corporation: *See*—
Flanagin, Stephen D.; Bubb, Howard G.; and Scantlin, John R., 4,556,970, Cl. 370-58.000.
McBrien, Gregory J., 4,556,850, Cl. 328-72.000.
Universal Maschinenfabrik Dr. Rudolf Schieber GmbH & Co., KG: *See*—
Kuhnert, Gottfried, 4,555,917, Cl. 66-78.000.
University of California: *See*—
Scott, Gary W.; and Cox, Aaron J., 4,556,979, Cl. 372-20.000.
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Wynnyckyj, John R.; Rhodes, Edward; and Marr, Robert, 4,556,019, Cl. 122-379.000.
University Patents, Inc.: *See*—
Walba, David M., 4,556,727, Cl. 560-73.000.
Upjohn Company, The: *See*—
McCall, John M., 4,556,656, Cl. 514-227.000.
Uranit GmbH: *See*—
Kasper, Horst; and Eckhard, Pritsch, 4,556,810, Cl. 310-256.000.
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USV Pharmaceutical Corp.: *See*—
Suh, John T.; Skiles, Jerry W.; Piwinski, John J.; Menard, Paul; and Jones, Howard, 4,556,652, Cl. 514-211.000.
Vadetsky, Jury V.: *See*—
Baldenko, Dmitry F.; Vadetsky, Jury V.; Goldobin, Vladimir B.; Gusman, Moisei T.; Kochnev, Anatoly M.; Nikomarov, Samuil S.; and Semenets, Valery I., 4,556,398, Cl. 464-16.000.

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Seiler, Claus-Dietrich; and Vahlensieck, Hans-Joachim, 4,556,724, Cl. 556-429.000.

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Levinstein, Hyman J.; and Vaidya, Sheila, 4,555,842, Cl. 29-571.000.

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Loizeau, Pierre, 4,556,135, Cl. 192-106.200.

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Maillard, Jacques G.; Van, Tri V.; Legeai, Jacky M.; and Benharkate, Marguerite M., 4,556,674, Cl. 514-426.000.

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Ronning, Patricia M.; and Vandesteeg, Gregg A., 4,556,410, Cl. 71-78.000.

van Eerden, Piet, to Wavin B.V. Plastic glazing profile designed for glazing window-frames. 4,555,884, Cl. 52-397.000.

van Heuvelen, Jan H., to Twentse Graveerindustrie B.V. Flexible gravure sleeve. 4,556,610, Cl. 428-666.000.

van Lingen, H. Peter, to Asahi/America Inc. Motor operated valve. 4,556,194, Cl. 251-129.120.

VanLoon, Donald F.; and Miller, Bernard F., to Ingersoll-Rand Company. Sealing means with spaced annular seals having support rings. 4,556,223, Cl. 277-118.000.

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Janssens, Frans E.; Torremans, Joseph L. G.; Hens, Jozef F.; and Van Offenwert, Theophilus T. J. M., 4,556,660, Cl. 514-272.000.

Van Prooijen, Pieter, to IHC Holland N.V. Method and apparatus for the measurement of fluid flow velocities. 4,555,947, Cl. 73-861.060.

Van Raaij, Karel W. M. Hydraulic cooling system for vacuum street sweeper. 4,555,825, Cl. 15-339.000.

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Vany, Gerard, to Cebal. Optical printing devices for printing on blanks which are intended for swaging. 4,556,312, Cl. 355-47.000.

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Schleiter, Daniel P., Sr., 4,556,083, Cl. 137-514.000.

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Vecellio, Bernardino, to Societa' Cavi Pirelli S.p.A. Electric power cable impregnated with insulating fluid. 4,556,756, Cl. 174-25.00R.

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Vercon, Inc.: *See*—
McCormick, Dennis J., 4,556,445, Cl. 156-423.000.

Vergason, Gary E.: *See*—
Bergman, Clark; Vergason, Gary E.; Allen, William; and Reed, Michael F., 4,556,471, Cl. 204-298.000.

Verheyden, Julien P. H.; and Martin, John C., to Syntex (U.S.A.) Inc. Substituted 9-(1-0- or 3-0-monosubstituted or 1,3-Di-0-substituted propoxymethyl)-purines as antiviral agents. 4,556,659, Cl. 514-262.000.

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Stiff, Rodney A.; Baker, Malcolm J.; and Lester, Leslie J., 4,555,896, Cl. 56-13.900.

Vevy Manufacturing Inc.: *See*—
Pilarczyk, Karol, 4,555,902, Cl. 60-39.500.

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Larson, Robert O., 4,556,562, Cl. 424-195.100.

Virag, Sandor: *See*—
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Viswanadham, Ramamurthy K., to Reed Rock Bit Company. Cermets having transformation-toughening properties and method of heat-treating to improve such properties. 4,556,424, Cl. 75-240.000.

Viswanathan, Raman: *See*—
Howells, Anthony P. S.; Dienglewicz, Anthony M.; Viswanathan, Raman; and Angelirn, Jorg A., 4,556,884, Cl. 340-860.000.

Vitek, Richard K.; and Smoot, Jeffrey B., to Fotodyne, Incorporated. Photographic documentation systems for CRT or video imaging screens. 4,556,914, Cl. 358-244.000.

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Kalakutsky, Lev I.; Sychenkov, Vladimir V.; Vlasov, Vladimir B.; and Dubrovsky, Adolf V., deceased, 4,556,849, Cl. 324-464.000.

Vogel, Wolfgang; and Zintler, Albert, to Webasto-Werk W. Baier GmbH & Co. Operating mechanism for movable parts, especially for sliding roofs and sliding/lifting roofs. 4,556,835, Cl. 318-663.000.

Voigt, Karl; Kamm, Jurgen; and Norbert, John, to Rheinisch-Westfalisches Elektrizitatswerk AG. Boiler-heating assembly with oil- and coal-fired ignition burners. 4,555,994, Cl. 110-261.000.

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Aspiotis, Evgeny K.; Vitjuk, Boris Y.; Malakhov, Evgeny I.; Danshin, Boris V.; Sokolov, Vladimir A.; Sidorov, Anatoly S.; and Volkov, Leonid V., 4,556,847, Cl. 324-307.000.

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Wada, Eiko, heiress: *See*—
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Wait, William R. Adjustable vehicle platform for a mechanic. 4,556,126, Cl. 182-150.000.

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Shibahara, Seiji; Okonogi, Tsuneo; Murai, Yasushi; Fukatsu, Shunzo; Niida, Taro; and Wakazawa, Tadashi, 4,556,513, Cl. 260-239.00A.

Wakeford, David R.: *See*—
Couch, Alan T.; Cruickshank, Terence D.; Davey, William L. E.; Marshall, Anthony R.; Tydd, Christopher B.; and Wakeford, David R., 4,556,017, Cl. 122-4.00D.

Wakeman, Thomas G.; and Maclin, Harvey M., to General Electric Company. Combustion chamber construction. 4,555,901, Cl. 60-39.320.

Walba, David M., to University Patents, Inc. Ferroelectric smectic liquid crystals. 4,556,727, Cl. 560-73.000.

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Dragunevicius, Algirdas J.; Kuhfus, Gerd; and Walker, Charles R. S., 4,556,763, Cl. 179-164.000.

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Wallace, Lawrence R., to Du Pont de Nemours, E. I., and Company. Low temperature flexible PVC blends. 4,556,694, Cl. 525-239.000.

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Wallenfels, Kurt: *See—*
Kaufman, Harold B., Jr.; McCarthy, John P.; Entner, Bernard J.; and Wallenfels, Kurt, 4,556,572, Cl. 426-289.000.
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Reedy, James D.; and Walsh, John J., 4,556,726, Cl. 556-460.000.
Walter, Ulrich. Press for producing pellets from bulk material. 4,556,381, Cl. 425-331.000.
Walther, Hans J., to Dragerwerk Aktiengesellschaft. Protective helmet with releasably connected protective breathing mask. 4,555,815, Cl. 2-424.000.
Wang, Samuel S.: *See—*
Fu, Yun-Lung; and Wang, Samuel S., 4,556,483, Cl. 209-166.000.
Ward, James W.; Schlanger, Herbert; McNulty, Hugh, Jr.; and Parker, Norman W., to Hughes Aircraft Company. Secondary ion collection and transport system for ion microprobe. 4,556,794, Cl. 250-309.000.
Warden, Gary A., to Westinghouse Electric Corp. Padmounted transformer. 4,556,758, Cl. 174-50.000.
Warner-Lambert Company: *See—*
Showalter, Howard D. H.; Johnson, Judith L.; Werbel, Leslie M.; and Elslager, Edward F., 4,556,654, Cl. 514-222.000.
Warrick, Frank G., to Sealed Power Corporation. Solenoid valve. 4,556,085, Cl. 137-625.650.
Warrington, Brian H.: *See—*
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Wason, Thomas D., to Cain Encoder Company. Apparatus for mounting an electrical sensing device or encoder on a data output indicator or meter. 4,556,844, Cl. 324-156.000.
Watanabe, Kiyohiko; Hattori, Yoshiyuki; Nakamura, Toshiaki; and Ohnishi, Shunsaku, to Nippondenso Co., Ltd. Pumping apparatus. 4,556,363, Cl. 415-53.00T.
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Watts, Lewis W., Jr.: *See—*
Sanderson, John R.; Nieh, Edward C. Y.; and Watts, Lewis W., Jr., 4,556,730, Cl. 560-256.000.
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Weber, Harold J.; Kuehnle, Manfred R.; Fraser, Kenneth D.; and Lindblom, Kenneth A., to Coulter Systems Corporation. Electrophotographic imaging apparatus, particularly for color proofing and method. 4,556,309, Cl. 355-3.0TR.
Weber, Heinrich; Lorenz, Kurt; Dungs, Horst; Bruns, Engelbert; and Osterholt, Gerd, to Carl Still GmbH & Co. KG, Firma. Method of charging dry coke cooling pit using sluice. 4,556,455, Cl. 201-39.000.
Weber, Robert E.: *See—*
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Weckwerth, Wolfgang: *See—*
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Wedgtrac Corporation: *See—*
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Weigert, Hans, to Electro-Matic Staplers, Inc. Trigger switch circuit for solenoid-actuated electric hand tool. 4,556,803, Cl. 307-140.000.
Weinhold, Karl. Device to connect hose or pipe ends. 4,556,241, Cl. 285-244.000.
Weininger, Joseph L.: *See—*
Kim, Bang M.; and Weininger, Joseph L., 4,556,469, Cl. 204-263.000.
Weiss, Richard; and Delagneau, Hubert, to Reckitt & Colman S.A. Holder for cleaning and/or colorant products intended to be hooked from the edge of a WC bowl. 4,555,819, Cl. 4-223.000.
Weitz, Robert; Neeff, Rutger; and Hugl, Herbert, to Bayer Aktiengesellschaft. Process for dyeing amide-containing fibre materials. 4,556,401, Cl. 8-641.000.
Welch, Terry A.: *See—*
Cohn, Martin; and Welch, Terry A., 4,556,960, Cl. 364-900.000.
Welch, Willard M., Jr.; Harbert, Charles A.; Koe, B. Kenneth; and Kraska, Allen R., to Pfizer Inc. Antidepressant derivatives of trans-4-phenyl-1,2,3,4-tetrahydro-1-naphthalenamine. 4,556,676, Cl. 514-554.000.
Welschof, Hans-Heinrich: *See—*
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Wenger, Jean: *See—*
Frater, Georg; Suchy, Milos; Wenger, Jean; and Winternitz, Paul, 4,556,413, Cl. 71-94.000.
Wennberg, Timothy J.: *See—*
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Werbel, Leslie M.: *See—*
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Duncan, Robert, 4,556,776, Cl. 219-121.0LC.
Evans, Harmon A., 4,556,420, Cl. 75-84.500.
Hawkins, Phillip J.; and Choby, Edward J., 4,555,833, Cl. 29-33.00T.
Heyne, Carl J., 4,555,972, Cl. 89-8.000.
Martens, Alan; and Myers, Gerry A., 4,555,906, Cl. 60-660.000.
Przybysz, John X., 4,555,845, Cl. 29-574.000.
Pudims, Albert A., 4,556,273, Cl. 339-103.00M.
Roswurm, Mark A., 4,556,842, Cl. 324-102.000.
Smith, Teresa B.; and Smith, Philip C., 4,556,975, Cl. 371-10.000.
Warden, Gary A., 4,556,758, Cl. 174-50.000.
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Wetter, Hansjurg; Baumeister, Peter; Radimerski, Paul; and Martin, Pierre, to Ciba Geigy Corporation. Process for producing 1-[2-(2,4-dichlorophenyl)-pentyl]-1H-1,2,4-triazole. 4,556,717, Cl. 548-262.000.
Weyl, Helmut: *See—*
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Brenner, Robert A.; and Sherer, Robert B., 4,555,919, Cl. 68-134.000.
Dasher, Marie E., 4,555,915, Cl. 62-448.000.
White, Claude C., to Birmingham Bolt Company. Combination expansion shell and resin secured mine roof anchor assembly. 4,556,344, Cl. 405-261.000.
Whitman, William C. Thermal energy storage unit. 4,556,100, Cl. 165-10.000.
Whitney, Daniel E.: *See—*
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Wickman, Kjell J.; and Wiklund, Klas R., to Pharos AB. Arrangement for checking dimensional accuracy. 4,556,322, Cl. 356-375.000.
Widrow, Bernard. Seismic exploration method and apparatus for cancelling interference from seismic vibration source. 4,556,962, Cl. 367-45.000.
Wiechowski, Joseph W., to Poly-Trusions, Inc. Method of manufacturing and assembling a grating constructed of resin bonded fibers. 4,555,886, Cl. 52-667.000.
Wiegemann, Hans-Bertram: *See—*
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Wielopolski, Lucian: *See—*
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Wild, Karl: *See—*
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Williams, Alan R.: *See—*
Reynolds, James E.; and Williams, Alan R., 4,556,422, Cl. 75-101.00R.
Williams, Franklin E., to Burlington Industries, Inc. Reinforced primary backing for carpet. 4,556,602, Cl. 428-259.000.
Willis, Donald H., to RCA Corporation. Scaling device as for quantized B-Y signal. 4,556,900, Cl. 358-23.000.
Willocks, Calvin B. Fence for a radial arm saw used as a dado cutter or molding cutter. 4,556,094, Cl. 144-253.00J.
Willson, Richard F.: *See—*
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Wilson, Keith B., to Air Products and Chemicals, Inc. Sieve type distillation tray with curved baffles. 4,556,522, Cl. 261-114.00R.
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Winnard, James R.: *See—*
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Winternitz, Paul: *See—*
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Wisdom, James R., to Wisdom, Shirley A. Apparatus for the uniform distribution of fuel to a multi cylinder spark ignition engine. 4,556,037, Cl. 123-531.000.

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Wittren, Richard A., to Deere & Company. Priority valve. 4,556,078, Cl. 137-118.000.

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Woernle, Rolf: *See—*
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Wohl, Ronald A.: *See—*
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Woirgard, Guy J.: *See—*
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Wolfges, Hans, to Mannesmann Rexroth GmbH. Device for controlling a hydromotor. 4,555,976, Cl. 91-420.000.

Wollar, Burnell J.; and Schwind, Richard J., to Phillips Plastics Corporation. Expansion rivet assembly. 4,556,351, Cl. 411-38.000.

Wolter, Albrecht; and Herchenbach, Horst, to Klockner-Humboldt-Deutz AG. Method for the manufacture of calcareous bonding agents, particularly cement. 4,556,428, Cl. 106-102.000.

Woltjen, Duane W.: *See—*
Sunnen, Robert M.; and Woltjen, Duane W., 4,555,875, Cl. 51-331.000.

Woo, Chi: *See—*
Erhardt, Paul W.; and Woo, Chi, 4,556,668, Cl. 514-353.000.

Wood, James C.: *See—*
Langmesser, Otto J., Jr.; Lock, Charles R.; and Wood, James C., 4,556,186, Cl. 248-429.000.

Woods, John: *See—*
Harris, Stephen J.; McKervey, M. Anthony; Melody, David P.; Woods, John; and Rooney, John M., 4,556,700, Cl. 526-209.000.

Woogerd, Stanley M., to Airrigation Engineering Company, Inc. Sewer cleaning foam composition and method. 4,556,434, Cl. 134-22.140.

Woznicki, Edward J.: *See—*
Porter, Stuart C.; Woznicki, Edward J.; Grillo, Susan M.; and D'Andrea, Louis F., 4,556,552, Cl. 424-32.000.

Wray, Thomas E.: *See—*
Strope, Douglas H.; and Wray, Thomas E., 4,556,845, Cl. 324-230.000.

Wright, Danny O.; and Weber, Robert E., to Allied Corporation. Single crystal dual microprocessor computing system. 4,556,955, Cl. 364-133.000.

Wright, Danny O.: *See—*
Pauwels, Michael A.; Wright, Danny O.; and Harvey, Bruce J., 4,556,943, Cl. 364-431.120.

Wright State University: *See—*
Deaton, Mark E., 4,555,965, Cl. 76-89.100.
Petrofsky, Jerrold S.; Glaser, Roger M.; Petrofsky, Steven H.; and Heaton, Harry H., III, 4,556,214, Cl. 272-117.000.

Wu, Yulin, to Phillips Petroleum Company. Corrosion inhibition. 4,556,110, Cl. 166-310.000.

Wu, Yulin; and Stapp, Paul R., to Phillips Petroleum Company. Method for inhibiting corrosion. 4,556,111, Cl. 166-310.000.

Wyatt, Richard: *See—*
Smith, David W.; and Wyatt, Richard, 4,556,980, Cl. 372-28.000.

Wynnyckyj, John R.; Rhodes, Edward; and Marr, Robert, to University of Waterloo. Convection section ash monitoring. 4,556,019, Cl. 122-379.000.

Xerox Corporation: *See—*
Chen, Tu, 4,556,291, Cl. 350-377.000.
George, Clifford L., 4,556,210, Cl. 271-157.000.
Gruber, Robert J.; Koch, Ronald J.; Knapp, John F.; and Bolte, Steven B., 4,556,624, Cl. 430-110.000.
Gundlach, Robert W.; Schwarz, William M., Jr.; and Gunther, Kenneth W., 4,556,013, Cl. 118-624.000.
Hermanson, Herman A.; and Fisher, Almon P., 4,556,890, Cl. 346-74.400.
Hoppner, Werner F.; and Landefeld, James A., 4,556,308, Cl. 355-3.00R.
Morris, Lyle E., 4,556,335, Cl. 400-144.200.
Schell, Richard P., 4,556,278, Cl. 350-3.710.

Yajima, Seishi; Okamura, Kiyohito; Hasegawa, Yoshio; and Yamamura, Takemi, to UBE Industries, Ltd. Process for production of sintered ceramic body. 4,556,526, Cl. 264-60.000.

Yamada, Hidetoshi, to Olympus Optical Co. Ltd. Solid state image sensing device having a number of static induction transistors arranged in a matrix form. 4,556,909, Cl. 358-212.000.

Yamada, Junichi: *See—*
Morita, Hiroshi; Kawada, Yasuyuki; Yamada, Junichi; and Ukigai, Toshiyuki, 4,556,108, Cl. 166-274.000.

Yamada, Kazuji; Sato, Hideo; Kato, Kazuo; Sasayama, Takao; Kawakami, Kanji; and Kanzawa, Ryosaku, to Hitachi, Ltd. Pressure transducer with temperature compensation circuit. 4,556,807, Cl. 307-491.000.

Yamada, Kiyoshi; and Murakami, Kazumasa, to Matsushita Electric Works, Ltd. Fire alarm system. 4,556,873, Cl. 340-630.000.

Yamada, Kiyoshi: *See—*
Samejima, Yasushi; Shiga, Minoru; Kano, Toshiji; and Yamada, Kiyoshi, 4,556,470, Cl. 204-266.000.

Yamada, Takemi; Satoh, Tamataro; Mizushina, Masaaki; Toyota, Koji; and Okamoto, Hiromi, to Nippon Kokan Kabushiki Kaisha. Exhaust valve for diesel engine and production thereof. 4,556,022, Cl. 123-188.0AA.

Yamaguchi, Akihiro: *See—*
Kawashima, Saburo; and Yamaguchi, Akihiro, 4,556,738, Cl. 564-329.000.

Yamaguchi, Hiroshi; Sawamoto, Kunifumi; Sanbuichi, Hiroshi; Morita, Tatsuo; and Takizawa, Satoshi, to Nissan Motor Company, Limited. Back-up system and method for engine coolant temperature sensor in electronic engine control system. 4,556,029, Cl. 123-41.150.

Yamaguchi, Hisashi: *See—*
Yoshikawa, Kazuo; Yamaguchi, Hisashi; and Asano, Toru, 4,556,871, Cl. 340-365.00C.

Yamamoto, Hideaki: *See—*
Ohta, Hisao; Baji, Toru; Izawa, Yuji; Ebisui, Eizou; Tsukada, Toshihisa; and Yamamoto, Hideaki, 4,556,800, Cl. 250-578.000.

Yamamoto, Hironori: *See—*
Sugiura, Yoji; Yamamoto, Hironori; Nishida, Keijiro; Shirai, Naoki; Takahashi, Kimio; Nakasugi, Mikio; and Saito, Norihisa, 4,556,285, Cl. 350-600.000.

Yamamoto, Hisashi, to Toyo Stauffer Chemical Co., Ltd. Manufacturing process of β-acylenamine. 4,556,515, Cl. 260-239.00B.

Yamamoto, Kazuko: *See—*
Nishio, Kazuo; Chiyomaru, Isao; Anma, Katsuo; Yamamoto, Kazuko; Ohno, Hiroshi; and Takayanagi, Noriyasu, 4,556,669, Cl. 514-368.000.

Yamamoto, Naoki: *See—*
Kishida, Kazuo; Yamamoto, Naoki; and Sato, Yasumasa, 4,556,692, Cl. 525-78.000.

Yamamoto, Toshiki; Kiriu, Yukio; Tsuneoka, Akira; and Sudo, Kunikane, to Nippon Steel Corporation. Abnormality detection and type discrimination in continuous casting operations. 4,556,099, Cl. 164-451.000.

Yamamura, Takemi: *See—*
Yajima, Seishi; Okamura, Kiyohito; Hasegawa, Yoshio; and Yamamura, Takemi, 4,556,526, Cl. 264-60.000.

Yamamuro, Kiyohiko: *See—*
Tanemura, Hatsumi; Ukai, Toshinao; Okazaki, Masaki; Deguchi, Naoyasu; Fujita, Munehisa; and Yamamuro, Kiyohiko, 4,556,633, Cl. 430-573.000.

Yamanaka, Seisuke; Sase, Masatoshi; Yoshioka, Osamu; and Kajino, Isao, to Sony Corporation. Solid state image pick-up devices. 4,556,912, Cl. 358-213.000.

Yamashita, Akira: *See—*
Shimizu, Wataru; and Yamashita, Akira, 4,556,886, Cl. 340-870.320.

Yamashita, Kiyoshi, to Tokyo Shibaura Denki Kabushiki Kaisha. Coffee maker. 4,555,984, Cl. 99-286.000.

Yamawaki, Ichiro: *See—*
Koda, Akihide; Hori, Mikio; Matsuura, Naosuke; Yasumoto, Mitsugi; Yamawaki, Ichiro; Ueda, Shuichi; and Tada, Yukio, 4,556,737, Cl. 564-218.000.

Yamawaki, Satoshi; Sugihara, Atsushi; Kobayashi, Yasushi; Ishida, Hiroshi; Kuramasu, Yukio; and Gotoh, Ichisei, to Alcan International Limited. Method of brazing aluminum employing fluoaluminate flux. 4,556,165, Cl. 228-223.000.

Yamazaki, Kazuhiro: *See—*
Urata, Shinji; Aoyagi, Shigehiko; and Yamazaki, Kazuhiro, 4,556,907, Cl. 358-210.000.

Yamazaki, Taro; Okamoto, Masashi; Iizuka, Tokio; Tsukada, Norishige; and Okamori, Kenji, to Kabushiki Kaisha Sakata Shokai. Method and apparatus for generating screened halftone images. 4,556,918, Cl. 358-283.000.

Yamura, Hitoo; Ikeda, Kakuro; and Sakai, Yuhichi, to Toshiba Ceramics Co., Ltd. Under-heater type furnace. 4,556,202, Cl. 266-242.000.

Yanagi, Mitsuo: *See—*
Kurihara, Yasutoshi; Suzuki, Yoshihiro; Ooue, Michio; Hachino, Hiroaki; and Yanagi, Mitsuo, 4,556,899, Cl. 357-80.000.

Yanagida, Shoji, to Ricoh Company, Ltd. Electromagnet driving circuit. 4,556,926, Cl. 361-154.000.

Yanai, Hiroshi: *See—*
Ohhashi, Mosaburo; and Yanai, Hiroshi, 4,556,815, Cl. 310-338.000.

Yasumoto, Mitsugi: *See—*
Koda, Akihide; Hori, Mikio; Matsuura, Naosuke; Yasumoto, Mitsugi; Yamawaki, Ichiro; Ueda, Shuichi; and Tada, Yukio, 4,556,737, Cl. 564-218.000.

Yeh, Gene H. C.; Martin, Joel L.; and Hsieh, Henry L., to Phillips Petroleum Company. Olefin polymerization. 4,556,647, Cl. 502-102.000.

Yie, Gene G., to Fluidyne Corporation. High velocity particulate containing fluid jet process. 4,555,872, Cl. 51-439.000.

Yokoi, Koji: *See—*
Naruse, Kazuo; Yokoi, Koji; and Kurokawa, Yoshiaki, 4,556,783, Cl. 219-388.000.

Yokomizo, Yoshikazu: *See—*
Shibata, Takehiko; and Yokomizo, Yoshikazu, 4,556,915, Cl. 358-280.000.

Yonekubo, Masatoshi: *See—*
Matsushita, Yoshikazu; Takei, Masaki; Yonekubo, Masatoshi; and Nishiwaki, Tsutomu, 4,556,891, Cl. 346-76.0PH.

Yorikane, Masaharu; and Ohseki, Noboru, to Nippon Electric Co., Ltd. Titanium coated aluminum leads. 4,556,897, Cl. 357-71.000.

Yoshida, Hitoshi: *See*—
Atsumi, Morihiro; Yoshida, Hitoshi; Ito, Nobuei; and Atsumi, Kinya, 4,556,780, Cl. 219-270.000.
Yoshida, Toshihiro: *See*—
Numata, Kiyoshi; Yoshida, Toshihiro; and Kokubo, Takashi, 4,556,283, Cl. 350-117.000.
Yoshida, Toshio, to Kawasaki Jukogyo Kabushiki Kaisha. Corrosion-resistant, double-wall pipe structures. 4,556,240, Cl. 285-55.000.
Yoshiga, Kenji, to Fuji Koki Manufacturing Co., Ltd. Motor-driven expansion valve. 4,556,193, Cl. 251-129.110.
Yoshikawa, Kazuo; Yamaguchi, Hisashi; and Asano, Toru, to Fujitsu Limited. Touch sensing device. 4,556,871, Cl. 340-365.00C.
Yoshimura, Kazushi: *See*—
Kuni, Asahiro; Hamada, Toshimitsu; Makihira, Hiroshi; and Yoshimura, Kazushi, 4,556,797, Cl. 250-492.200.
Yoshioka, Osamu: *See*—
Yamanaka, Seisuke; Sase, Masatoshi; Yoshioka, Osamu; and Kajino, Isao, 4,556,912, Cl. 358-213.000.
Yoshisato, Akiyuki, to Alps. Electric Co., Ltd. Indoor unit of receiver for broadcasting satellite. 4,556,988, Cl. 455-182.000.
Yoshitake, Akira: *See*—
Murakami, Yoshiaki; Shiba, Kunio; Yoshitake, Akira; Takahashi, Keietsu; Ueda, Nobuo; and Hazue, Masaaki, 4,556,689, Cl. 525-54.100.
Yoshiyuki, Takada; and Haruhisa, Tamura, to Matsushita Electric Industrial Co., Ltd. High frequency heating appliance having protection against rush currents. 4,556,773, Cl. 219-10.55C.
Young, A. Mark: *See*—
Hugus, George D.; and Young, A. Mark, 4,556,963, Cl. 367-143.000.
Yudenfriend, Herbert. Process and apparatus for forming a window panel having an energy control film laminate. 4,556,446, Cl. 156-551.000.
Zahnradfabrik Friedrichshafen, AG.: *See*—
Lang, Armin; and Knodler, Helmut, 4,555,975, Cl. 91-417.00R.
Zaidan Hojin Biseibutsu Kagaku Kenkyukai: *See*—
Umezawa, Hamao; Takeuchi, Tomio; Nishizawa, Rinzo; Takahashi, Katsutoshi; Nakamura, Teruya; and Umeda, Yoshihisa, 4,556,735, Cl. 564-157.000.
Zedrosser, Ulrich, to Steyr-Daimler-Puch Aktiengesellschaft. Rifle breech assembly. 4,555,860, Cl. 42-25.000.
Zeiler, Hans-Joachim: *See*—
Grohe, Klaus; Petersen, Uwe; Zeiler, Hans-Joachim; and Metzger, Karl G., 4,556,658, Cl. 514-254.000.
Grohe, Klaus; Zeiler, Hans-Joachim; and Metzger, Karl G., 4,556,709, Cl. 544-117.000.
Zeitz, Vernon: *See*—
Kuhn, Martin C.; and Zeitz, Vernon, 4,556,467, Cl. 204-193.000.
Zervos, Daniel H., to Honeywell Inc. On-off thermostat based modulating air flow controller. 4,556,169, Cl. 236-49.000.
Zintler, Albert: *See*—
Vogel, Wolfgang; and Zintler, Albert, 4,556,835, Cl. 318-663.000.
Ziogas, Phiovos D.; and Ranganathan, V. Thathachary T., to Canadian Patents and Development Limited. DC-AC Power converter including two high frequency resonant link converters. 4,556,937, Cl. 363-8.000.
Znojkiewicz, Maciej E., to Northern Telecom Limited. Mounting a semiconductor device in a microwave cavity oscillator. 4,556,852, Cl. 331-96.000.
Zoecon Corporation: *See*—
Lee, Shy-Fuh; and Henrick, Clive A., 4,556,520, Cl. 260-951.000.
Zuber, Pierre A. M., to Westinghouse Electric Corp. Transit vehicle speed maintaining control apparatus and method. 4,556,941, Cl. 364-426.000.
Zucker, Udo: *See*—
Gloss, Erwin; Lotterbach, Gerhard; Perenthaler, Egbert; Schenk, Manfred; Van Woudenberg, Jan F.; and Zucker, Udo, 4,556,036, Cl. 123-491.000.
Zwikelmaier, Kurt E.: *See*—
Franz, John E.; and Zwikelmaier, Kurt E., 4,556,415, Cl. 71-100.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 3RD DAY OF DECEMBER, 1985

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Atwood, Kenton; and Wright, James H., to United Catalysts, Inc. Catalyst for steam reforming of hydrocarbons. Re. 32,044, Cl. 502-335.000.

Carroll, Alexander A.: *See*—
Sheilds, J. Rodger; and Carroll, Alexander A., Re. 32,042, Cl. 29-156.80R.

Elliott Turbomachinery Company, Inc.: *See*—
Sheilds, J. Rodger; and Carroll, Alexander A., Re. 32,042, Cl. 29-156.80R.

Routson, Edwin J. Portable concrete mixing and transport apparatus. Re. 32,043, Cl. 366-2.000.

Sheilds, J. Rodger; and Carroll, Alexander A., to Elliott Turbomachinery Company, Inc. Stator blade assembly for turbo machines. Re. 32,042, Cl. 29-156.80R.

United Catalysts, Inc.: *See*—
Atwood, Kenton; and Wright, James H., Re. 32,044, Cl. 502-335.000.

Wright, James H.: *See*—
Atwood, Kenton; and Wright, James H., Re. 32,044, Cl. 502-335.000.

LIST OF DESIGN PATENTEES

Akers, Ronald L. Wall mounted guitar bracket. 281,576, 12-3-85, Cl. D8-373.000.

Althans, Richard K.: *See*—
Claxton, Bruce A.; and Althans, Richard K., 281,600, Cl. D14-68.000.

American Motors Corporation: *See*—
Teague, Richard A.; Nixon, Robert C.; Krispinsky, George M.; Kenitz, Jack E.; and Guichard, Gary D., 281,594, Cl. D12-169.000.

American Tourister, Inc.: *See*—
Bomes, Harvey; Pulichino, John; Migliore, John; and Barber, Jack, 281,547, Cl. D3-71.000.

Associated Mills, Inc.: *See*—
Grube, Clifford E., 281,618, Cl. D23-149.000.

AT&T Technologies, Inc.: *See*—
Joffe, Richard M.; and McGarvey, John N., 281,599, Cl. D14-62.000.

Babini, Carlos J., to United States Surgical Corporation. Surgical staple remover. 281,624, 12-3-85, Cl. D24-26.000.

Banner, Alvin C.; Finegold, Hyman B.; and Seitz, David R., to Globe Tool & Engineering Company, The. Cabinet for armature winding machine. 281,612, 12-3-85, Cl. D15-122.000.

Barbato, Michael W.; Hodges, Henry T.; and Mattson, Ray W., to Mattel, Inc. Toy motorbike or similar article. 281,615, 12-3-85, Cl. D21-81.000.

Barber, Jack: *See*—
Bomes, Harvey; Pulichino, John; Migliore, John; and Barber, Jack, 281,547, Cl. D3-71.000.

Barnes, Stephen R., to Lawrence Medical Systems, Inc. Hand held ultrasonic transducer for patient monitoring use. 281,623, 12-3-85, Cl. D24-17.000.

Bassett Furniture Industries, Inc.: *See*—
Stuenkel, Walter E., 281,554, Cl. D6-334.000.

Berglund, Jan, to Wicanders AG. Tear open bottle cap. 281,584, 12-3-85, Cl. D9-438.000.

Bertone, Nuccio, to Northern Technologies Limited. Keyboard. 281,605, 12-3-85, Cl. D14-100.000.

Bertone, Nuccio, to Northern Technologies Limited. Raised border arrangement for the top surface of a keyboard panel. 281,608, 12-3-85, Cl. D14-115.000.

Bomes, Harvey; Pulichino, John; Migliore, John; and Barber, Jack, to American Tourister, Inc. Garment bag. 281,547, 12-3-85, Cl. D3-71.000.

Borkan, Florence; and Cafiero, Thomas A., to Pharmacaps, Inc. Combined receptacle cap and capsule piercing device therefor. 281,582, 12-3-85, Cl. D9-437.000.

Borkan, Florence: *See*—
Cafiero, Thomas A.; and Borkan, Florence, 281,583, Cl. D9-437.000.

Bradshaw, Charlotte S. Insulated bag. 281,546, 12-3-85, Cl. D3-53.000.

Bruffey, Robert D., Jr.; Crosby, Samuel C.; Gaunt, Lorraine E.; and Hoover, George H., to Coca-Cola Company, The. Beverage dispenser cabinet. 281,568, 12-3-85, Cl. D7-308.000.

Burnett, William R.: *See*—
Nuttall, Michael J.; Burnett, William R.; and Fiorella, Charles M., 281,606, Cl. D14-100.000.

Busse, Rido, to Soehnle-Waagen GmbH & Co. Postage scale. 281,587, 12-3-85, Cl. D10-91.000.

Cafiero, Thomas A.; and Borkan, Florence, to Pharmacaps, Inc. Combined receptacle cap and capsule piercing device therefor. 281,583, 12-3-85, Cl. D9-437.000.

Cafiero, Thomas A.: *See*—
Borkan, Florence; and Cafiero, Thomas A., 281,582, Cl. D9-437.000.

Carpenter, Beverly J.; and Carpenter, William R. Coupon file receptacle. 281,614, 12-3-85, Cl. D19-90.000.

Carpenter, William R.: *See*—
Carpenter, Beverly J.; and Carpenter, William R., 281,614, Cl. D19-90.000.

Cartwright, Jerry G., to Wesco Manufacturing, Inc. Rotating tool storage cabinet. 281,558, 12-3-85, Cl. D6-469.000.

Chandler, Thomas B. Electronic scale for measuring golf club parameters. 281,586, 12-3-85, Cl. D10-91.000.

Chap, John P., to Selfix, Inc. Hanger bracket and hook therefor. 281,575, 12-3-85, Cl. D8-363.000.

Chicago Cutlery Consumer Products, Inc.: *See*—
Gangelhoff, Ronald J.; Jacobi, Robert L.; Peters, William; and Pashley, Robert, 281,566, Cl. D7-46.000.

Clairol Incorporated: *See*—
Yurdin, Carl, 281,629, Cl. D28-38.000.

Claxton, Bruce A.; and Althans, Richard K., to Motorola, Inc. Radio pager or similar article. 281,600, 12-3-85, Cl. D14-68.000.

Clear, Michael C.: *See*—
Stourton, Virginia; and Clear, Michael C., 281,565, Cl. D7-39.000.

Coca-Cola Company, The: *See*—
Bruffey, Robert D., Jr.; Crosby, Samuel C.; Gaunt, Lorraine E.; and Hoover, George H., 281,568, Cl. D7-308.000.

Convergent Technologies, Inc.: *See*—
Nuttall, Michael J.; Burnett, William R.; and Fiorella, Charles M., 281,606, Cl. D14-100.000.

Crosby, Samuel C.: *See*—
Bruffey, Robert D., Jr.; Crosby, Samuel C.; Gaunt, Lorraine E.; and Hoover, George H., 281,568, Cl. D7-308.000.

Cut Rate Plastic Hangers, Inc.: *See*—
Zuckerman, Jack M.; and Warmath, John, 281,552, Cl. D6-318.000.

CWS AG: *See*—
Reidel, Hermann, 281,578, Cl. D9-375.000.

Darr, Richard C.: *See*—
Larson, Craig A.; and Darr, Richard C., 281,577, Cl. D9-367.000.

Desilets, David E.: *See*—
Marino, Jerry C.; and Desilets, David E., 281,607, Cl. D14-106.000.

Diamond, Michael K. Combined dental mirror and moisture control apparatus. 281,622, 12-3-85, Cl. D24-13.000.

Dodds, Dale L., to J. J. Mauget Co. Micro-feeder tube for plant injection device. 281,571, 12-3-85, Cl. D8-1.000.

dos Santos, Jose C. Building block. 281,627, 12-3-85, Cl. D25-88.000.

dos Santos, Jose C. Building block. 281,628, 12-3-85, Cl. D25-88.000.

Doyel, John S. Shoe buffer. 281,550, 12-3-85, Cl. D4-102.000.

Drackett Company, The: *See*—
Machack, Robert W.; and Howard, John R., 281,635, Cl. D32-50.000.

Drag Specialties, Inc.: *See*—
Preisler, James M.; Stahel, Alwin J.; and Rudd, Thomas H., 281,593, Cl. D12-126.000.

Drummond, Archie G., Jr.; and Fahnstrom, Dale E., to Tone Brothers, Inc. Jug or similar article. 281,579, 12-3-85, Cl. D9-376.000.

Duncan, Clarence R., Jr. Mobile cabinet for video game and accessories. 281,556, 12-3-85, Cl. D6-429.000.

Dyer, Richard A. Extension ladder stepdeck. 281,626, 12-3-85, Cl. D25-69.000.

Emhart Industries, Inc.: *See*—
Miller, Theodore H., 281,573, Cl. D8-302.000.

Eneroth, Jan-Mats; Maatta, Osten; and Soderholm, Roland, to Flakt Aktiebolag. Floor for a spray paint booth. 281,619, 12-3-85, Cl. D23-163.000.
F.LLI Guzzini S.p.A.: *See*—
Pozzi, Ambrogio, 281,564, Cl. D7-3.000.
Fahnstrom, Dale E.: *See*—
Drummond, Archie G., Jr.; and Fahnstrom, Dale E., 281,579, Cl. D9-376.000.
Fibrecast (UK) Limited: *See*—
Thornalley, Michael J., 281,617, Cl. D21-247.000.
Finegold, Hyman B.: *See*—
Banner, Alvin C.; Finegold, Hyman B.; and Seitz, David R., 281,612, Cl. D15-122.000.
Fiorella, Charles M.: *See*—
Nuttall, Michael J.; Burnett, William R.; and Fiorella, Charles M., 281,606, Cl. D14-100.000.
Flakt Aktiebolag: *See*—
Eneroth, Jan-Mats; Maatta, Osten; and Soderholm, Roland, 281,619, Cl. D23-163.000.
Gustavsson, Lennart; and Maatta, Osten, 281,620, Cl. D23-163.000.
Flanagan, Michael L. Combined vehicle seat arm rest and drink holder. 281,545, 12-3-85, Cl. D3-40.000.
FMC Corporation: *See*—
Pratt, Thomas A., 281,633, Cl. D32-16.000.
Pratt, Thomas A., 281,634, Cl. D32-16.000.
Fulster, Chris. Pair of stabilizers for small boat. 281,595, 12-3-85, Cl. D12-317.000.
Gabriel, Kori F.; and Tomaszewski, Wojtek T. Bottle opener. 281,572, 12-3-85, Cl. D8-40.000.
Gangelhoff, Ronald J.; Jacobi, Robert L.; Peters, William; and Pashley, Robert, to Chicago Cutlery Consumer Products, Inc. Cutting board. 281,566, 12-3-85, Cl. D7-46.000.
Gaunt, Lorraine E.: *See*—
Bruffey, Robert D., Jr.; Crosby, Samuel C.; Gaunt, Lorraine E.; and Hoover, George H., 281,568, Cl. D7-308.000.
Glawe, Robert I. Infant seat. 281,553, 12-3-85, Cl. D6-333.000.
Globe Tool & Engineering Company, The: *See*—
Banner, Alvin C.; Finegold, Hyman B.; and Seitz, David R., 281,612, Cl. D15-122.000.
Grube, Clifford E., to Associated Mills, Inc. Air cleaner. 281,618, 12-3-85, Cl. D23-149.000.
Grun, Otto. Aquatic sculpture or similar article. 281,592, 12-3-85, Cl. D11-135.000.
Guenther, John G. Telephone handset. 281,598, 12-3-85, Cl. D14-53.000.
Guichard, Gary D.: *See*—
Teague, Richard A.; Nixon, Robert C.; Krispinsky, George M.; Kenitz, Jack E.; and Guichard, Gary D., 281,594, Cl. D12-169.000.
Gustavsson, Lennart; and Maatta, Osten, to Flakt Aktiebolag. Venturi wall for wet separators and the like. 281,620, 12-3-85, Cl. D23-163.000.
Harada, Yoshinori; and Kawata, Yoshiaki, to Matsushita Electric Industrial Co., Ltd. Television receiver. 281,603, 12-3-85, Cl. D14-82.000.
Herbst, Walter B., to Thomas Industries Inc. Air compressor. 281,609, 12-3-85, Cl. D15-9.000.
Hikiss, Gary J. Simulated time bomb. 281,591, 12-3-85 Cl. D11-157.000.
Hodges, Henry T.: *See*—
Barbato, Michael W.; Hodges, Henry T.; and Mattson, Ray W., 281,615, Cl. D21-81.000.
Honda Giken Kogyo K.K.: *See*—
Mikado, Yoshio, 281,611, Cl. D15-12.000.
Honda Giken Kogyo Kabushiki Kaisha: *See*—
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LIST OF STATUTORY INVENTION REGISTRATIONS

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AT&T Technologies Incorporated: *See*—
Soloway, Gerald S., H2, Cl. 340-701.000.

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Cullen, Barry A., to W. R. Grace & Co. Processs for the preparation of iminodiacetonitrile. H4, 12-3-85, Cl. 260-465.50A.

Friedman, Moshe; and Serlin, Victor, to United States of America, The. Generation of a modulated IREB with a frequency tunable by a magnetic field. H6, 12-3-85, Cl. 315-4.000.

Mukherjee, Dilip. Pressure-fired fluidized-bed boiler installation. H5, 12-3-85, Cl. 60-39.182.

Serlin, Victor: *See*—
Friedman, Moshe; and Serlin, Victor, H6, Cl. 315-4.000.

Soloway, Gerald S., to AT&T Technologies Incorporated. Video display system with increased horizontal resolution. H2, 12-3-85, Cl. 340-701.000.

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Wattana-Chayakul, Montri, to Bell Telephone Laboratories, Inc. Split barrel insulation displacing connector. H1, 12-3-85, Cl. 339-97.00P.

Yachnis, Michael, to United States of America, The. Original method of drydocking ships. H3, 12-3-85, Cl. 405-3.000.

LIST OF DEFENSIVE PUBLICATIONS

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Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O. G. 687.

Cavaliere, Joseph R.; Horng, Cheng T.; Konian, Richard R.; Rupprecht, Hans S.; and Schwenker, Robert O. Structure of an improved bipolar transistor. T106,101, 12-3-85, Cl. 357-34.000.

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CLASSIFICATION OF PATENTS

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NOTE.—First number, class; second number, subclass; third number, patent number

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705 4,555,949
4,555,950
861.06 4,555,947
861.28 4,555,951
861.47 4,555,952
862.04 4,555,953
4,555,954
862.06 4,555,955
862.32 4,555,956
864.14 4,555,957

CLASS 74

10.33 4,555,958
334 4,555,959
471 XY 4,555,960
579 E 4,555,961
710.5 4,555,962
798 4,555,963
869 4,555,964

CLASS 75

0.5 B 4,556,416
35 4,556,417
43 4,556,418
68 R 4,556,419
84.5 4,556,420
91 4,556,421
101 R 4,556,422
125 4,556,423
240 4,556,424

CLASS 76

89.1 4,555,965

CLASS 83

71 4,555,966
106 4,555,967
209 4,555,968
471.3 4,555,969

CLASS 84

313 4,555,970

CLASS 89

1.11 4,555,971
8 4,555,972
148 4,555,973

CLASS 91

363 A 4,555,974
417 R 4,555,975
420 4,555,976
446 4,555,977
506 4,555,978

CLASS 92

85 B 4,555,979
88 4,555,980

CLASS 98

1 4,555,981
42.22 4,555,982
114 4,555,983

CLASS 99

286 4,555,984
353 4,555,985
427 4,555,986

CLASS 100

118 4,555,987
154 4,555,988

CLASS 101

424 4,555,989

CLASS 106

14.23 4,556,425
18.32 4,556,426
20 4,556,427
102 4,556,428

CLASS 108

20 4,555,990

CLASS 109

9 4,555,991

CLASS 110

229 4,555,992
234 4,555,993
261 4,555,994
335 4,555,995
345 4,555,996

CLASS 112

121.11 4,555,997
121.12 4,555,998
121.27 4,555,999
222 4,556,000
277 4,556,001

CLASS 114

39 4,556,003
61 4,556,004
146 4,556,005
162 4,556,006
210 4,556,007
264 4,556,002
265 4,556,008
354 4,556,009

CLASS 116

22 R 4,556,010

CLASS 118

46 4,556,011
268 4,556,012
624 4,556,013

CLASS 119

29 4,556,014
56 R 4,556,015
102 4,556,016

CLASS 122

4 D 4,556,017
35 4,556,018
379 4,556,019

CLASS 123

41.15 4,556,029
143 B 4,556,020
185 S 4,556,021
188 AA 4,556,022
190 A 4,556,023
196 AB 4,556,024
198 F 4,556,025
4,556,026
323 4,556,027
339 4,556,028
425 4,556,030
437 4,556,031
438 4,556,032
440 4,556,033
470 4,556,034
488 4,556,035
491 4,556,036
531 4,556,037
564 4,556,038
569 4,556,039
643 4,556,040

CLASS 124

35 A 4,556,041
89 4,556,042

CLASS 126

21 A 4,556,043
77 4,556,044
96 4,556,045
299 D 4,556,046
400 4,556,047
417 4,556,048
429 4,556,049

CLASS 127

30 4,556,429
36 4,556,430
37 4,556,431
4,556,432

CLASS 128

1 R 4,556,050
1.5 4,556,051
11 4,556,052
80 C 4,556,053
80 H 4,556,054
82.1 4,556,055
156 4,556,056
303.1 4,556,057
305 4,556,058
305.3 4,556,059
325 4,556,060
419 PG 4,556,062
419 PT 4,556,061
4,556,063
423 R 4,556,064
639 4,556,065
660 4,556,066
663 4,556,067
719 4,556,068
746 4,556,069
804 4,556,070

CLASS 131

84.4 4,556,071
282 4,556,072
297 4,556,073

CLASS 132

92 R 4,556,074

CLASS 134

6 4,556,433
22.14 4,556,434

CLASS 135

65 4,556,075

CLASS 137

72 4,556,076
112 4,556,077
118 4,556,078
240 4,556,079
296 4,556,080
366 4,556,081
375 4,556,082
514 4,556,083
526 4,556,084
625.65 4,556,085
852 4,556,086

CLASS 138

30 4,556,087

CLASS 139

452 4,556,088
453 4,556,089

CLASS 141

59 4,556,090
82 4,556,091
98 4,556,092
206 4,556,093

CLASS 144

253 J 4,556,094

CLASS 148

6.35 4,556,435
175 4,556,436
188 4,556,437

CLASS 156

79 4,556,438
92 4,556,439
181 4,556,440
247 4,556,441
350 4,556,442
356 4,556,443
359 4,556,444
423 4,556,445
551 4,556,446
578 4,556,447
605 4,556,448
659.1 4,556,449

CLASS 160

166 R 4,556,095

CLASS 162

204 4,556,450
205 4,556,451
233 4,556,452
274 4,556,453
358 4,556,454

CLASS 164

79 4,556,096
137 4,556,097
316 4,556,098
451 4,556,099

CLASS 165

10 4,556,100
45 4,556,101
95 4,556,102
122 4,556,103
145 4,556,104
165 4,556,105
166 4,556,106

CLASS 166

272 4,556,107
274 4,556,108
295 4,556,109
310 4,556,110
4,556,111

CLASS 171

16 4,556,112

CLASS 172

91 4,556,113

CLASS 174

21 C 4,556,755
25 R 4,556,756
35 R 4,556,757
50 4,556,758
68.5 4,556,759

CLASS 175

20 4,556,114

CLASS 177

211 4,556,115

CLASS 179

2 EB 4,556,760
6.05 4,556,761
157 4,556,762
164 4,556,763

CLASS 180

79.1 4,556,116
89.13 4,556,117
89.15 4,556,118
219 4,556,119

CLASS 181

120 4,556,120
129 4,556,121
136 4,556,122

CLASS 182

36 4,556,123
63 4,556,124
91 4,556,125
150 4,556,126

CLASS 184

3.1 4,556,127

CLASS 187

9 R 4,556,128
38 4,556,155
41 4,556,129

CLASS 188

218 A 4,556,130

CLASS 192

7 4,556,131
12 BA 4,556,132
58 B 4,556,138
70.16 4,556,133
103 F 4,556,134
106.2 4,556,135
4,556,136

111 A 4,556,137

CLASS 194

4 C 4,556,139
4,556,140

CLASS 198

750 4,556,141
822 4,556,142
841 4,556,143

CLASS 200

16 C 4,556,764
61.71 4,556,765
81.9 R 4,556,766
148 A 4,556,767
302.2 4,556,768
340 4,556,769

CLASS 201

39 4,556,455

CLASS 202

186 4,556,456
206 4,556,457
227 4,556,458
263 4,556,459

CLASS 203

19 4,556,460
29 4,556,461

CLASS 204

6 4,556,462
98 4,556,463
159.15 4,556,464
182.2 4,556,465
4,556,466
193 4,556,467
243 R 4,556,468
263 4,556,469
266 4,556,470
298 4,556,471
406 4,556,472
409 4,556,473
416 4,556,474
427 4,556,475

CLASS 206

214 4,556,144
329 4,556,145
440 4,556,146
493 4,556,147

CLASS 208

48 AA 4,556,476
111 4,556,477
120 4,556,478
164 4,556,479
211 4,556,480

CLASS 209

127 4,556,481
166 4,556,482
4,556,483

CLASS 210

90 4,556,484
169 4,556,485
170 4,556,486
267 4,556,487
321.1 4,556,488
321.3 4,556,489
349 4,556,490
608 4,556,491
668 4,556,492
699 4,556,493
785 4,556,494

CLASS 211

189 4,556,148

CLASS 213

34 4,556,149

CLASS 219

10.49 R 4,556,770
10.55 C 4,556,773
10.55 F 4,556,771
4,556,772
60.2 4,556,774
76.13 4,556,775
121 LC 4,556,776
124.34 4,556,777
125.11 4,556,778
216 4,556,779
270 4,556,780
4,556,781
370 4,556,782
388 4,556,783
425 4,556,784
460 4,556,785
464 4,556,786

CLASS 220

4 B 4,556,150
67 4,556,151
276 4,556,152

334 4,556,153

CLASS 221

147 4,556,154

CLASS 222

386.5 4,556,156
600 4,556,157

CLASS 223

88 4,556,158

CLASS 224

257 4,556,159

CLASS 225

67 4,556,160

CLASS 227

83 4,556,161

CLASS 228

50 4,556,162
173.6 4,556,163
199 4,556,164
223 4,556,165

CLASS 229

3.1 4,556,166
45 R 4,556,167

CLASS 236

25 A 4,556,168
49 4,556,169
86 4,556,170

CLASS 237

12.3 B 4,556,171

CLASS 239

533.13 4,556,173
590.5 4,556,172

CLASS 241

1 4,556,174
57 4,556,175

CLASS 242

38 4,556,176
107.4 A 4,556,177
130 4,556,178

CLASS 244

102 R 4,556,179
135 R 4,556,180

CLASS 248

74.1 4,556,181
179 4,556,182
221.4 4,556,183
330.1 4,556,184
421 4,556,185
429 4,556,186
503 4,556,187
553 4,556,188
649 4,556,189

CLASS 249

99 4,556,190
119 4,556,191

CLASS 250

201 4,556,787
203 R 4,556,788
206 4,556,789
211 J 4,556,790
225 4,556,791
231 SE 4,556,792
267 4,556,793
309 4,556,794
324 4,556,795
338 4,556,796
492.2 4,556,797
4,556,798
577 4,556,799
578 4,556,800

CLASS 251

58 4,556,192
129.11 4,556,193
129.12 4,556,194
129.20 4,556,195
214 4,556,196
315 4,556,197

CLASS 252

8.55 D 4,556,495
8.8 4,556,502
33 4,556,496
51.5 A 4,556,497
4,556,499
51.5 R 4,556,498
61 4,556,500
70 4,556,501
73 4,556,503
135 4,556,504
194 4,556,505
512 4,556,506
518 4,556,507
4,556,508

542 4,556,509
547 4,556,510
573 4,556,511

CLASS 254

122 4,556,198
348 4,556,199
424 4,556,200

CLASS 256

59 4,556,201

CLASS 260

239 A 4,556,513
4,556,514
239 B 4,556,515
239 BC 4,556,512
239.1 4,556,516
245.2 T 4,556,517
413 4,556,518
549 4,556,519
921 4,556,520

CLASS 261

94 4,556,521
114 R 4,556,522
123 4,556,523

CLASS 264

1.2 4,556,524
8 4,556,525
60 4,556,526
171 4,556,527
221 4,556,528
258 4,556,529
298 4,556,530

CLASS 266

242 4,556,202

CLASS 267

141.1 4,556,203
148 4,556,204

CLASS 269

2 4,556,205
16 4,556,206
41 4,556,207

CLASS 270

52 4,556,208

CLASS 271

10 4,556,209
157 4,556,210
221 4,556,211
315 4,556,212

CLASS 272

3 4,556,213
117 4,556,214
119 4,556,215
126 4,556,216
141 4,556,217

CLASS 273

30 4,556,218
181 F 4,556,219
218 4,556,220
248 4,556,221

CLASS 277

9 4,556,222
118 4,556,223
4,556,224
152 4,556,225
207 A 4,556,226
4,556,227

CLASS 279

1 SJ 4,556,228

CLASS 280

5.22 4,556,229
301 4,556,230
432 4,556,231
4,556,232
513 4,556,233
610 4,556,237
688 4,556,234
690 4,556,235
701 4,556,238
729 4,556,236

CLASS 285

55 4,556,240
244 4,556,241
341 4,556,242

CLASS 290

44 4,556,801

CLASS 291

25 4,556,243

CLASS 292

65 4,556,244

CLASS 294

31.2 4,556,245
82.11 4,556,246

CLASS 296

24 R 4,556,247
183 4,556,248

CLASS 297

30 4,556,249
192 4,556,250
284 4,556,251
438 4,556,252
440 4,556,253
460 4,556,254
483 4,556,255

CLASS 299

33 4,556,256
68 4,556,257

CLASS 301

128 4,556,258

CLASS 303

7 4,556,259
116 4,556,260
4,556,261

CLASS 307

66 4,556,802
140 4,556,803
296 R 4,556,804
359 4,556,805
475 4,556,806
491 4,556,807
571 4,556,808

CLASS 308

6 C 4,556,262
6 R 4,556,263

CLASS 310

114 4,556,809
256 4,556,810
266 4,556,811
324 4,556,812
334 4,556,813
4,556,814
338 4,556,815

CLASS 313

366 4,556,816
371 4,556,817
395 4,556,818
413 4,556,819
470 4,556,820

CLASS 315

8 4,556,821
67 4,556,822
111.81 4,556,823
362 4,556,824
408 4,556,825

CLASS 318

92 4,556,826
254 4,556,827
4,556,828
4,556,829
326 4,556,830
434 4,556,831
467 4,556,832
567 4,556,833
569 4,556,834
663 4,556,835
696 4,556,836

CLASS 320

2 4,556,837

CLASS 323

285 4,556,838

CLASS 324

66 4,556,839
73 R 4,556,840
4,556,841
102 4,556,842
107 4,556,843
156 4,556,844
230 4,556,845
238 4,556,846
307 4,556,847
309 4,556,848
464 4,556,849

CLASS 328

72 4,556,850

CLASS 329

50 4,556,851

CLASS 331

96 4,556,852

CLASS 333

26 4,556,853
34 4,556,854

113 4,556,855
124 4,556,856

CLASS 335

210 4,556,857
234 4,556,858
301 4,556,859

CLASS 338

22 SD 4,556,860

CLASS 339

17 LC 4,556,264
4,556,265
29 R 4,556,266
59 M 4,556,267
74 R 4,556,268
75 M 4,556,269
91 R 4,556,270
94 C 4,556,271
99 R 4,556,272
103 M 4,556,273
147 R 4,556,274
218 M 4,556,275
258 R 4,556,276

CLASS 340

62 4,556,861
67 4,556,862
81 R 4,556,863
310 A 4,556,864
4,556,866
310 R 4,556,865
347 AD 4,556,870
347 DD 4,556,868
4,556,869
347 NT 4,556,867
365 C 4,556,871
542 4,556,872
630 4,556,873
638 4,556,874
679 4,556,875
713 4,556,876
4,556,877
724 4,556,878
750 4,556,879
814 4,556,880
825 4,556,881
825.06 4,556,882
825.54 4,556,883
860 4,556,884
870.25 4,556,885
870.32 4,556,886

CLASS 343

8 4,556,887
362 4,556,888
707 4,556,889

CLASS 346

74.4 4,556,890
76 PH 4,556,891
4,556,892
135.1 4,556,893
140 R 4,556,894

CLASS 350

1.7 4,556,277
3.71 4,556,278
96.15 4,556,279
96.16 4,556,280
96.20 4,556,281
96.21 4,556,282
117 4,556,283
174 4,556,284
335 4,556,286
336 4,556,287
339 R 4,556,288
350 R 4,556,289
358 4,556,290
377 4,556,291
394 4,556,292
400 4,556,293
432 4,556,294
454 4,556,295
475 4,556,296
529 4,556,297
588 4,556,298
600 4,556,285
603 4,556,299

CLASS 351

137 4,556,300

CLASS 352

78 R 4,556,301

CLASS 354

83 4,556,302
141 4,556,303
288 4,556,304
298 4,556,305
304 4,556,306

CLASS 355

3 R 4,556,307
4,556,308

3 TR 4,556,309
14 R 4,556,310
4,556,311
47 4,556,312

CLASS 356

1 4,556,313
73.1 4,556,314
237 4,556,317
313 4,556,315
316 4,556,318
346 4,556,316
350 4,556,319
4,556,320
4,556,321
375 4,556,322

CLASS 357

23.7 4,556,895
70 4,556,896
71 4,556,897
4,556,898
80 4,556,899

CLASS 358

23 4,556,900
75 4,556,901
106 4,556,903
107 4,556,902
147 4,556,904
154 4,556,905
180 4,556,906
210 4,556,907
212 4,556,908
4,556,909
4,556,910
4,556,911
213 4,556,912
237 4,556,913
244 4,556,914
280 4,556,915
282 4,556,916
283 4,556,918
343 4,556,917

CLASS 360

74.1 4,556,919
77 4,556,920
4,556,921
85 4,556,922
93 4,556,923
106 4,556,924
113 4,556,925

CLASS 361

154 4,556,926
215 4,556,927
321 4,556,929

CLASS 362

32 4,556,930
61 4,556,931
103 4,556,932
267 4,556,933
268 4,556,928
279 4,556,934
4,556,935
371 4,556,936

CLASS 363

8 4,556,937

CLASS 364

133 4,556,955
162 4,556,956
171 4,556,957
200 4,556,938
4,556,939
4,556,958
424 4,556,940
426 4,556,941
431.07 4,556,942
431.12 4,556,943
466 4,556,944
470 4,556,945
481 4,556,946
550 4,556,947
757 4,556,948
821 4,556,949
827 4,556,950
900 4,556,951
4,556,952
4,556,953
4,556,954
4,556,959
4,556,960

CLASS 365

194 4,556,961

CLASS 366

2 Re.32,043
31 4,556,323
85 4,556,324
130 4,556,325

CLASS 367

45 4,556,962
143 4,556,963

CLASS 369

44 4,556,964
45 4,556,965
52 4,556,966
275 4,556,967
287 4,556,968
291 4,556,969

CLASS 370

58 4,556,970
4,556,971
60 4,556,972
69.1 4,556,973
89 4,556,974

CLASS 371

10 4,556,975
25 4,556,976
37 4,556,977
49 4,556,978

CLASS 372

20 4,556,979
28 4,556,980
86 4,556,981

CLASS 374

45 4,556,326
115 4,556,327
144 4,556,328
173 4,556,329
185 4,556,330

CLASS 375

10 4,556,982
60 4,556,983

CLASS 376

441 4,556,531

CLASS 377

47 4,556,984

CLASS 382

30 4,556,985
42 4,556,986

CLASS 384

130 4,556,239
453 4,556,331

CLASS 400

3 4,556,332
58 4,556,333
124 4,556,334
144.2 4,556,335

CLASS 401

199 4,556,336

CLASS 403

255 4,556,337

CLASS 404

28 4,556,338
112 4,556,339

CLASS 405

195 4,556,340
4,556,341
203 4,556,342
210 4,556,343
261 4,556,344

CLASS 407

114 4,556,345

CLASS 408

88 4,556,346
230 4,556,347
233 4,556,348

CLASS 410

140 4,556,349

CLASS 411

10 4,556,350
38 4,556,351
433 4,556,352

CLASS 412

5 4,556,353

CLASS 413

15 4,556,354

CLASS 414

280 4,556,355
458 4,556,356
469 4,556,357
550 4,556,358
621 4,556,359
701 4,556,360
744 A 4,556,361
744 B 4,556,362

CLASS 415

53 T 4,556,363
170 A 4,556,364

CLASS 416

134 A 4,556,365
155 4,556,366

CLASS 417

18 4,556,367
208 4,556,368
437 4,556,369
517 4,556,370
539 4,556,371

CLASS 418

1 4,556,372
75 4,556,373

CLASS 419

5 4,556,532
11 4,556,533

CLASS 420

445 4,556,534
580 4,556,535

CLASS 422

7 4,556,536
49 4,556,537
70 4,556,538
125 4,556,539
142 4,556,540
145 4,556,541
147 4,556,542
171 4,556,543
186.04 4,556,544

CLASS 423

167 4,556,545
226 4,556,546
230 4,556,547
321 S 4,556,548
326 4,556,549
328 4,556,550
644 4,556,551

CLASS 424

32 4,556,552
52 4,556,553
70 4,556,554
85 4,556,555
89 4,556,556
94 4,556,557
101 4,556,558
114 4,556,559
145 4,556,560
151 4,556,561
195.1 4,556,562

CLASS 425

114 4,556,374
127 4,556,375
133.5 4,556,376
138 4,556,377
143 4,556,378
163 4,556,379
188 4,556,380
331 4,556,381
462 4,556,382

CLASS 426

2 4,556,564
3 4,556,565
96 4,556,566
4,556,567
4,556,568
104 4,556,569
4,556,570
265 4,556,571
289 4,556,572
467 4,556,573
570 4,556,574
594 4,556,575
615 4,556,576
649 4,556,577
4,556,578

CLASS 427

1 4,556,579
8 4,556,580
29 4,556,581
38 4,556,582
4,556,583
54.1 4,556,584
85 4,556,585
282 4,556,586
304 4,556,587

CLASS 428

13 4,556,588
35 4,556,589
4,556,590
43 4,556,591
4,556,592
72 4,556,593
83 4,556,594
143 4,556,595
152 4,556,596
201 4,556,597
209 4,556,598
216 4,556,599
4,556,600
219 4,556,601
259 4,556,602
283 4,556,603
323 4,556,604
331 4,556,605
412 4,556,606
627 4,556,607
629 4,556,608
659 4,556,609
666 4,556,610
694 4,556,611

CLASS 429

54 4,556,612
101 4,556,613
191 4,556,614
192 4,556,615
4,556,616
196 4,556,617
217 4,556,618

CLASS 430

17 4,556,619
25 4,556,620
49 4,556,621
58 4,556,622
83 4,556,623
110 4,556,624
145 4,556,625
274 4,556,626
312 4,556,627
314 4,556,628
331 4,556,629
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D2—	10	281,540		429	281,556		40	281,572			281,589		83	281,604			281,620
	191	281,541		449	281,557		302	281,573		32	281,585		100	281,605	D24—	10	281,621
	320	281,542		469	281,558		358	281,574		79	281,590			281,606		13	281,622
		281,543		487	281,559		363	281,575		135	281,592		106	281,607		17	281,623
D3—	26	281,544		501	281,560		373	281,576		157	281,591		115	281,608		26	281,624
	40	281,545			281,562	D9—	367	281,577	D12—	126	281,593	D15—	9	781,609		41	281,625
	53	281,546		503	281,561		375	281,578		169	281,594		12	281,610	D25—	69	281,626
	71	281,547		505	281,563		376	281,579		317	281,595			281,611		88	281,627
	78	281,548	D7—	3	281,564		415	281,520	D14—	30	281,596		122	281,612			281,628
		281,549		39	281,565		435	281,581		34	281,597	D19—	39	281,613	D28—	38	281,629
D4—	102	281,550		46	281,566		437	281,582		53	281,598		90	281,614		99	281,630
D6—	310	281,551		77	281,567			281,583		62	281,599	D21—	81	281,615	D30—	39	281,631
	318	281,552		308	281,568		438	281,584		68	281,600		101	281,616	D32—	15	281,632
	333	281,553		317	281,569	D10—	91	281,586			281,601		247	281,617		16	281,633
	334	281,554		321	281,570			281,587			281,602	D23—	149	281,618			281,634
	406	281,555	D8—	1	281,571	D11—	12	281,588		82	281,603		163	281,619		50	281,635

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	30	5,583		38	5,585		41	5,586			5,587		47	5,588		70	5,589

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